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Looking Upstream for Factors Influencing Mental Illness in a Low-Resource Setting

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MBA, University of Ilorin, 2013

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Dissertation Submitted in Partial Fulfillment

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Abstract

An investigation into the upstream determinants of mental disorders could provide insight into pathways by which these risk factors could relate to different groups of mental illness. The study was a quantitative inquiry using constructs within the Rothman's sufficient and component cause framework to examine the pathways existing between upstream risk factors for schizophrenic and mood disorders. The study population was drawn from a convenience sample of clients accessing services at the psychiatry departments of a secondary mental health institution in North-Central Nigeria. The mean age of the participants in this study was 35.5years. The majority were males (53.4%), single (55.1%), belonged to Christian religion (84.7%), in the lower socioeconomic group (55.6%), and were diagnosed with mood disorders (59.3%). There were no statistically significant differences in the way a family history of mental disorders influenced schizophrenic and mood disorders. On univariate analysis, there was a statistically significant difference in the way intimate partner violence (IPV) influenced schizophrenic and mood disorders (p = .01) with majority (85.7%) of participants that were exposed to IPV having schizophrenia. However, this difference paled to insignificance on multivariate analysis (p = .06). Multivariate analysis showed that when socioeconomic status was introduced as a confounder, there was no statistically significant difference in the way schizophrenic and mood disorders influenced the participants' coping strategies. Understanding the risk factors for mental health disorders could contribute to the quality of care for individuals with the disorder and can be a useful resource for those affected by mental illnesses and their family.

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Chapter 1: Introduction to the Study

The aphorism “we are all born equal” is tested by day-to-day evidence of the contribution of several factors related to conception and birth outcomes. This euphemism often masks the realities of the effect of emergent upstream factors on the health of mothers and their children. While the processes leading to birth are uniform across ethnicity, race, social stratifications, and settings; the health of individuals may be more open to the whims of social and economic factors that determine the health of populations. Upstream factors contribute to all phases of life from the conception and birth which are sensitive development periods and are often influenced by families and communities (Kaiser et al., 2016). The pathways of disease etiology or distribution have been classified into the proximal or upstream, and distal or downstream, with connecting levels between the proximal and distal factors (Krieger 2008, as cited in Reading & Greenwood, 2018). Matching these upstream conditions with the events that take place many years into the life of an individual could produce a wealth of information about the health of a population. For instance, socioeconomic variables and social determinants of health (SDOH) are more proximal factors defining the condition under which people are born, grow, live, work, and age (Shokouh et al., 2017). Upstream SDOH comprises of the physical, social, economic, and environmental factors that determine health (Bharmal et al., 2015).

Background

The burden of mental health disorders on the individual, family, and society should be examined to understand the risks and perpetuating factors to identify solutions

that are crosscutting and address the health system challenges. Mental health disorders have reverberating effect on communities and remain a challenge for health systems. Mental health disorders are among the highest leading cause of morbidity and mortality, with around 450 million people suffering from the condition (World Health Organization [WHO], 2020a; p. 1]. According to the WHO (2020a), one in four people in the world will be affected by either mental or neurological illnesses at one point or another in their lives. In Nigeria, mental illnesses like anxiety, substance abuse disorders, and depression are estimated to have more debilitating complications on people than complications arising from cardiac diseases, AIDS, accidents, and even wars combined (Ngui et al., 2010 as cited in Suleiman 2016). An estimated 20%–30% of the population are affected by mental disorders (Suleiman, 2016). There is a considerable number of people affected, given the fact that the Nigeria population is projected to be almost 219 million in the year 2020 (Nigeria Bureau of Statistics, 2020).

In this study, I examined how upstream risks like adverse childhood experiences (ACEs) result in more distal outcomes or mental health disorders. ACEs have been found to contribute significantly to onset of mental disorder in all stages of life, including in childhood (McLaughlin, 2016), adolescent stage (Bielas et al., 2016; Mendonça & Ludermir, 2017) and in adult life (Nurius et al., 2015; McLafferty et al., 2015). The review of literature in this study corroborated the primacy of domains such as trauma or abuse (Kelley et al, 2015), household dysfunction (Björkenstam et al., 2016; Clemens et al., 2019; Felitti et al., 2019; Gilbert et al., 2015), criminality in families (Finkelhor et al.,

2015) and intimate partner violence or parental separation (Choi et al, 2017; Mendonça & Ludermir, 2017); in understanding the etiogenesis of mental disorders.

Importance of personality factors like coping strategies, as well as history of mental illness in first degree relatives, were equally enumerated to examine the extent of knowledge existing on interactions between these upstream risk factors and mental health disorders. Pecuniary personality characteristics account for some of the difference that exist in human behaviors. Individual unique personality traits like their locus of control and coping strategies support people in navigating the existential challenges of life (Allen, Balfour, Bell & Marmot, 2014). The literature review showed that these unique internal mechanisms can be cognitive (Botvinick & Braver, 2015), affective (Bault et al., 2017), and motivational or behavioral in nature (Compas et al., 2017). These systems in individuals help them to meet basic needs of life and equip them with strategies that protect them from interpersonal or physical harm (Kraaij & Garnefski, 2019). There is scant literature examining influence of coexisting risk factors as pathways to causation of mental health disorder.

Familial illnesses have been attributed to genetic changes like gene methylation (Romens et al., 2015), familial clustering (Isomura et al., 2015), gene-environment interactions (Lopizzo et al., 2015), among others. Socioeconomic disadvantage was identified as a major contributor to onset and outcome of mental health disorders Allen, Balfour, Bell & Marmot (2014). Social determinants of mental health. International review of psychiatry, 26(4), 392-407. This study revealed the reasonable correlation between all socioeconomic status (SES) indicators and mental health disorders. I found

that factors such as unemployment (Laanani et al., 2015), culture (Kirmayer & Ryder, 2016), income (Ribeiro et al., 2017), and social circumstances (Adhvaryu et al., 2019) predict outcomes in clients with mental health disorders. A few studies, like that by Agerbo et al. (2015), investigated the influence of coexisting family history and socioeconomic risk factor on onset of mental disorders. However, there is a gap in knowledge about how multiple risks combine to produce associations with mental health disorders. I attempted to answer these major questions and extend the knowledge about how multiple risk contribute to chronic disease etiology. The finding from this study can be helpful material for future research in disease epidemiology.

Problem Statement

Mental illnesses, like many other chronic diseases, are linked to both innate processes and extraneous experiences that take place several years before manifestation of the first symptom by sufferers (Paquette, 2015). Mental illness causation is complex and varies based on disorders and individual pecuniary traits. Although the etiologies of majority of mental illnesses are unknown, there is an agreement by various authors that different social (Lund et al., 2018; Shokouh et al., 2017), economic (Frasquilho et al., 2015; Rohde et al., 2016), environmental (Fusar-Poli et al, 2017), epigenetic processes (Babenko et al., 2015; Mitchell, & Akbarian, 2016; Nestler et al., 2016), family-related factors (Agerbo et al., 2015; Yap & Jorm, 2015), peculiar individual personality traits (Tyrer et al., 2015), and even maternal-related factors (Newman et al., 2016) contribute to the development or progression of mental disorders. Other authors have examined the role of early life on an individual's development, as well as susceptibility to chronic

diseases (e.g., DeShong et al., 2015; Langley-Evans, 2015; Nusslock & Miller, 2016; Paquette, 2015). Therefore, there is a consensus that mental illness causation cuts across all stages of development from the prenatal period, childhood, adolescence to adulthood.

Most mental disorders equally have multiple, rather than single causations (Beauchaine et al., 2018). Although a modest body of literature is available on the role of individual risk factors in causation of mental illnesses, emerging research suggests role of multiple causality especially in the distal or upstream phase of development of an individual (Chen & Lee, 2018; Vins et al., 2015). It is essential that adequate attention be focused on elucidating the individual contributory role of these factors and how they interrelate to produce mental illnesses (Palmier-Claus et al., 2016).

The problem is that most of the available literature is either limited to a single disorder (e.g., Nestler et al., 2016; Rohde et al., 2016) or explored explanations that are common to all types of mental illnesses (e.g., Seal et al, 2009). Most studies do not demonstrate how these upstream risk factors relate with one another to produce mental disorders (e.g., Babenko et al, 2015; DeShong et al., 2015; Langley-Evans, 2015; Vins et al., 2015). Secondly, many of the authors reviewed did not show sufficient evidence of true statistically significant association; using rigorous designs that are based on theoretical frameworks. This leaves a gap in the literature (Agerbo et al, 2015; Babenko et al., 2015; Nestler et al., 2016; Yap & Jorm, 2015). Adequate attention needs to be focused on elucidating the individual contributory role of these factors and how they interrelate to produce mental illnesses.

Purpose of the Study

The purpose of this quantitative study was to identify pathways by which schizophrenic and mood mental disorders occur, linking important responsible events like family history of mental illness in first degree relatives, early adverse experiences, individual cognitive coping strategies, and other associative conditions that contribute to mental illness in a way that may suggest specific clinical strategies for anticipating and preventing mental illnesses.

The independent variables were the family history of mental illness in first degree relatives, early adverse experiences (comprising history of child abuse, dysfunctional family, childhood development, criminal behavior, divorce, domestic violence, drug abuse, early memories, family background, and home environment), and individual cognitive coping strategies variables. The dependent variable was defined by the presence and type of mental illness (assessed under two broad classification of mental illnesses schizophrenic or mood disorders), controlling for socioeconomic background of the client and sociodemographic factors.

Theoretical Framework for the Study

I used Rothman's sufficient and component cause model (VanderWeele, 2017) to examine the relative risk of upstream family history of mental illness in first degree relatives, early adverse experiences, community, and individual level factors in influencing the two groups of mental disorders. Rothman proposed an application of the sufficient and component cause model to epidemiology in 1976 (Rothman & Greenland, 2005). According to Rothman and Greenland (2005), the sufficient and component cause

model also referred to as the 'causal pie model', describes causal factors as "antecedent events, conditions, or characteristics that was necessary for the occurrence of the disease", i.e., those without which an event would not have occurred or take place later (Rothman & Greenland, 2005, pg. 1).

Using the Rothman's conceptualization of sufficient cause, the pathway to mental illnesses can be defined as a set of minimal conditions and events that inevitably leads to disease. According to VanderWeele (2017), sufficient cause is defined by the minimum set of cause enough to elicit a disease. The use of the term minimal implies that there is none of the itemized conditions that is unessential. According to Rothman (1986), the completion of a sufficient cause may be synonymous to the disease onset. As a part of the construct, "component causes" are explained as important causes that are not sufficient on their own but are required components of one or more distinct sufficient causes (Rothman & Greenland, 2005). Component causes are also viewed as those that build up to make up a sufficient cause (Rothman & Greenland, 2005). It can therefore be said that when any component cause is absent from the minimal necessary set, the remaining component causes become insufficient.

The theory illustrates some very important principles, including multicausality, strength of a cause, interaction among causes, and the sum of attributable fraction for each component cause may not sum up to 100% (VanderWeele, 2017). The central notion of the theory is that individuals are often susceptible to multiple diseases and that the outcome of each disease is multi-factorial, resulting from co-occurrence of several factors.

I used the constructs within the framework to find the correlation that exists between the upstream risk factors like family history of mental illness in first degree relatives, adverse early experiences, and individual coping strategies and mental illness in individuals. I also examined the proportion of these component upstream causes that can be attributable to the mental illness, and how they build up to make a sufficient cause for mental illness causation. This was examined in two socioeconomic populations in the study area. Chapter 2 will provide more detailed logical connections among key elements of the framework.

Research Questions

RQ1. Is there statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives?

$H_0$1: There is no statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives.

H_a1: There is a statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives.

RQ2. Is there statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence on mental health outcome)?

$H_0$2: There is no statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence on mental health outcome).

H_a2: There is a statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence on mental health outcome).

RQ3. Is there statistically significant difference in coping strategies between patients with schizophrenia and patients with mood disorders?

$H_0$3: There is no statistically significant difference in coping strategies between patients with schizophrenia and patients with mood disorders.

H_a3: There is a statistically significant difference in coping strategies between patients with schizophrenia and patients with mood disorders.

RQ4. Do socioeconomic risk factors have a mediating effect on these relationships?

$H_0$4: Socioeconomic risk factors do not have a mediating effect on these relationships

H_a4: Socioeconomic risk factors have a mediating effect on these relationships

Nature of Study

A quantitative research methodology was used to deductively examine the relationship between upstream exposure to family history of mental illness in first degree

relatives, early adverse experiences, community and individual risk factors, and mental illness, excluding the role of a mediator like socioeconomic factors. According to Creswell and Creswell (2017), quantitative technique allows the researcher to use instruments that measures explicit items which an inquirer seeks to understand, and make inferences, critically analyze relationships between variables. Since precision is essential in examining physical models and for standardization of weights and measures, maximizing precision will involve taking measurements (Zyphur & Pierides, 2019). However, there are always some elements of error in any form of measurement, which may serve as a threat to validity (Gillen, Snowberg, & Yariv, 2019). Hence, Zyphur and Pierides (2019) advised that when using quantitative inquiry, the researcher chooses the most trustworthy datum, rather than averages, in other to avoid errors.

Quantitative inquiry uses deductive approach to test hypotheses, while controlling for other related causes, and putting in place measures to avoid bias (Creswell & Creswell, 2017). The design has some checks that controls for threat to validity (Cypress, 2017). In situations where the researcher has some certainty around eliciting the quantity they wish to control for, in terms of measurement error, Gillen et al. (2019) advised that only two controls are needed. Hence, a control group of participants from middle socioeconomic group, with almost similar characteristics was introduced to limit bias. This provides some guarantee that participants with the outcome are correctly identified. A prevalence study or assessment of the separate potential risk factors observed may not adequately explain relative risk or proportion of mental illnesses that resulted in the presence of factors among people with mental health disorders. It is easier to quantify

risk due to specific potential causes using controlled epidemiological studies (VanderWeele, 2017).

When studies use quantitative methods, the data collection technique to be employed is often adapted to gathering information using approaches that provide useable answers to the research question (Creswell & Creswell, 2017). The following tools were used to collect data in my study: (a) Family history - research diagnostic criteria (FH-RDC; Endicott, 1978), which provides information to measure the family level factors which have correlations with the onset of mental illnesses in the participants; (b) The Adverse Childhood Experience Questionnaire (ACE-Q) was used to elicit information on child abuse, dysfunctional family, childhood development, criminal behavior, divorce, domestic violence, drug abuse, early memories, family background, and home environment; (c) The Cognitive Emotion Regulation Questionnaire (CERQ), a multidimensional questionnaire guided in identifying the cognitive emotion regulation strategies (or cognitive coping strategies), investigating the "relationships between the use of specific cognitive coping strategies, personality variables, psychopathology and other problems" (Universiteit Leiden, 2015, para 3); and (d) Clients' medical folders/records provided further information on relevant social, family-related, and other relevant sociodemographic factors.

SES was assessed using the modified Fahmy and El-Sherbini scale (El-Gilany, El-Wehady, & El-Wasify, 2012). The scale assesses SES using seven broad domains: education and cultural, occupation, family, family possessions, economic, home sanitation, and health care (El-Gilany et al., 2012). The participants' SES were

categorized into low, middle, and high SES. However, my study focused on participants in the lower and middle socioeconomic levels, as studies have shown that both levels form the most prevalent socioeconomic groups in Nigeria (see Olaniyi, 2013; Ovwigho, 2011).

The study population was drawn from a convenience sample of clients that access services at the mental health department of University of Abuja teaching hospital, Gwagwalada. The study site is a tertiary mental health institution in north-central Nigeria. Study participants were selected using the convenience sampling technique, a nonprobability sampling technique that is quick easy to use and affordable (see Goel et al., 2015). The convenience sampling technique has a relative advantage over other methods for clinical research because it allows the researcher to enroll subjects based on their accessibility and availability (Elfil & Negida, 2017). I included accessible populations of clients with mental health disorders attending the Karu General Hospital within the study period that meet the eligibility criteria in this study.

The appropriate sample size for this study was estimated using the G*Power 3.1 software (see Zhang & Hoffmann, 2016). The sample size was calculated using a power of .8 and alpha level of .05, which are considered as standard measures in psychological research and appropriate values to establish adequate statistical power (see Byrne et al., 2014). Since there is limited research on interaction between upstream risk factors and mental health disorders, as well as a limited number of possible participants, both medium and large effect sizes (f^2) of .25 and .47 respectively were used for the multiple regression calculations. The smallest essential sample size calculated using a large effect

size was 41. With a medium effect size, a conservative number of 101 participants was obtained. When a 10% nonresponse rate is added to the average sample size, the total sample size that was sought for this study comes to approximately 110.

Definitions

The following phrases and terms were used in the study:

Causal pathways: The processes or mechanisms through which an outcome is brought into being (Marshall & Galea, 2015).

Child abuse: Child abuse is defined as "any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act which presents an imminent risk of serious harm." (Child Welfare Information Gateway, 2019, p 1).

Childhood development: "A set of concepts, principles, and facts that explain, describe and account for the processes involved in change from immature to mature status and functioning" (Britto et al., 2017, p. 2). Child development is divided into three broad categories - cognitive, physical, and social emotional development.

Cognitive coping strategies: These include thoughts and cognitions through which thoughts or emotions are managed or regulated (Yeung et al., 2016).

Dysfunctional families: These are families in which problems tend to be chronic and children do not consistently get their needs met (Kansas State University, 2015).

Early adverse experiences: Early adverse experiences are distressing occurrences that happen in the life an individual with lasting effects on their well-being and health (Park et al., 2016). According to Park et al. (2016), "these experiences range from

physical, emotional, or sexual abuse to parental divorce or the incarceration of a parent or guardian" (p. 1).

Family history: The MedicineNet, Inc. (2016a) defined this as "family structure and relationships within the family, including information about diseases in family members" (para. 5). They are transmittable traits from one generation to another, present in either first degree relatives (mother, father, siblings, children) or second-degree relatives (cousins, aunts, uncles, or grandparents, cousins). In this study, emphasis is on presence of mental illness in first degree relatives of the study participants.

First-degree relatives: These are close family members like father, mother, siblings and children.

Home environment: This refers to domestic parts of people's lives that has a role to play in their living conditions. These factors may be physical, poverty, parenting, or social circumstances (La Placa & Corlyon, 2016).

Low-resource settings: Low resource settings are “those parts of the world in which the resources for health care (money, human resources, and technical infrastructure) are scarce” (Fritz et al., 2015; p 2).

Mental health disorders: These are a "wide range of mental health conditions which can affect people's thinking behavior or mood" (Mayo Foundation for Medical Education and Research, 2016; para 3). The Mayo Foundation for Medical Education and Research (2016) lists broad examples like anxiety disorders, schizophrenia, depression, addictive behaviors and eating disorders.

Mood disorders: A mood disorder is a "mental health class that health professionals use to broadly describe all types of depression and bipolar disorders" (John Hopkins University, n.d.; para 2).

Prevalence: Prevalence is a "statistical concept referring to the number of cases of a disease that are present in a particular population at a given time" (MedicineNet, Inc., 2016b; para 3).

Risk factors: Something that increases the chance of developing a disease. (National Institutes of Health, n.d).

Sociodemographic factors: These refer to the gender, age distribution, race/ethnicity, income and marital status of a population or individual (Executive Office of Health and Human Services, 2016).

Socioeconomic factors: Socioeconomic factors are those that explain the social class or standing of an individual or group, often measured as a combination of income, occupation, and education (American Psychological Association, 2016).

Upstream factors: The upstream analogy as described by University of Colorado Denver (2016) refers to primary prevention. It is a "key concept in population health or public health approach that focuses on primary prevention, population-based health consists of population-wide efforts to prevent disease" (University of Colorado Denver, 2016; para 10). These are often different from distal risk factors which according to WHO (2020) "are further back in the causal chain and act via a number of intermediary causes" (para 12).

Assumptions

There was an assumption that the evaluators who helped with my data collection did not influence the responses by participants on aspects of the questionnaire that are verbally administered. It is also assumed that participants had a clear understanding of the questions asked and respondents gave honest answers to the screening instruments. In addition, it was assumed that the medical records of the clients that were assessed contained correctly filled information on the clients' medical history, as this assisted in classifying the disease type, as well as provide answers to certain questions on the family history of client. Further, it is assumed that the sample is representative of population of clients with mental health disorders in North-Central region of Nigeria, a region that is serviced by the mental health institution where the study was conducted.

Other assumptions were made as an integral part of this study. First, I assumed that additional studies may be needed to ascertain the true causal role of risk factors such as family history of mental illnesses, early adverse experiences, individual cognitive coping strategies, and socioeconomic status in causation of mental health disorders among the clients. A prospective evaluation of the clients' exposure to the risk factors may provide such valuable information as temporal association and consistency of the association, two very critical factors that are measurable using the study approach.

Scope and Delimitations

The scope of this research study was centered on examining the associations that exists between upstream family history of mental illness in first degree relatives, adverse early experiences, and individual coping strategies on mental illness. The study was

delimited to highlighting the difference in outcome for the two most common SES groups (low- and middle-income groups) in North-Central Nigeria where the study took place. Therefore, it was not possible to evaluate all possible income groups in the population.

Limitations

Limitations in research often highlight the inherent challenges that may arise with the research design or method used (ProThesis Writer, 2021). Significant attempts were made to minimize potential limitations. The case control design used in this study often makes it difficult to overcome potential bias and confounding (see Mansournia et al., 2018). This is further compounded by the fact that exposure to upstream risk factors often occurs before onset of disease. For instance, I measured risk of family history on mental illness through a self-report by first degree relatives of clients, hence the risk of recall bias presents a major limitation. To overcome bias resulting from inaccurate recall, I framed questions in a manner that it aided accurate recall. I also verified responses from study participants through their medical records or other reliable sources of clinical information.

The study was also exposed to threat of differential errors, which affects the study’s validity. This is further buttressed in findings by Sterne et al. (2016) who discovered that differential errors are a greater threat to a study's validity in case-control studies than nondifferential ones. This was avoided by structuring questions in a way that supports precise recall. By so doing, inaccurate recall is limited among both controls and cases, hence reducing differential recall bias.

There is a risk of misclassification bias, which may originate if the process used in detecting exposure status for those in the low and middle socioeconomic groups are not clearly defined. Nondifferential misclassification occurs when misclassification of exposure is not reliant on the actual clinical diagnosis (Public Health Action Support Team, 2020), an example for my study would be if it was the same in both participants with schizophrenic or mood disorders. To avoid misclassification bias, the information and clinical diagnosis made in the participants' medical records was used to determine the mental health disorder group to which the participants belong.

I recognized that the need to manage missing data is crucial to the success of studies. When participants do not respond to questions, missing data arise and often skews results (Kang, 2013). I used only cases with complete data sets in the statistical analysis to eliminate likelihood for missing data. Since study results may not be generalizable to all mental illnesses, I concentrated on clients with two broad classes of mental health disorders (schizophrenia and mood disorders), based on the Diagnostic and Statistical Manual (DSM) V classification of mental illnesses diagnoses (see American Psychiatric Association, 2013). This implies that similar results may not be obtained if the study is replicated using dissimilar populations.

Significance of the Study

Unlike earlier studies, in this study I highlighted the true differences in outcomes between patients with schizophrenia and patient with mood disorders when individuals are exposed to upstream risk factors, using the background of well-tested theories to isolate the roles of mediating factors in disease causation. Contrary to received wisdom,

the development of mental health disorders observed in sufferers may not be directly related to upstream factors (Compton & Shim, 2014). However, there is a lack of literature in low-resource settings of sub-Saharan Africa examining the correlation between mental illnesses and upstream factors, as well as the relative contributory role of synergistic factors. It could be informative to examine the likely pathways through which upstream risk factors result in mental illness in affected individuals. Although several studies have examined the association between distal factors and mental illnesses (e.g., Ben-David et al., 2015; Blasco et al., 2019; Picardi et al., 2013; Porche et al., 2015), very few in sub-Saharan Africa have proposed an effective model that defines the pathways to mental illnesses, particularly in low resource settings like the one in which my study took. Much of the available literature is from developed, Western countries (e.g., Babenko et al., 2015; Frasquilho et al., 2015; Fusar-Poli et al., 2017; Lund et al., 2018; Nestler et al., 2016; Rohde et al., 2016; Shokouh et al., 2017). This was one of the rare studies of its type in sub-Saharan Africa that explores the potential correlation between individual upstream risk factors, including family history of mental illness in first degree relatives, environment, community factors and individual level factors and mental disorders; as well as the way in which each of these component causes interact to produce mental health disorders

Positive Social Change

Findings from the study could inform clinical practice, supporting or disproving true relationships between family history of mental illness in first degree relatives, environment, community factors, and individual differences in coping strategies and

mental illnesses. Elucidating the association between these etiologic factors and mental illness can be useful resource for those affected by mental illnesses and their family. Such insight or understanding may help them better adjust to the challenges of managing the illness. Clinicians and psychologists who manage these affected individuals in resources constrained settings should have a unique glimpse of the interrelationship between these associative factors and the client's socioeconomic circumstances. Increasing awareness about these upstream risk factors may help improve visibility for the mental illnesses, creating opportunities for targeted development interventions by program managers. This study may become a resource material for further studies, generating research interests and discussions on the true relations existing between upstream factors and mental health disorders in sub-Saharan Africa.

Summary

Chapter 1 introduced the relationship between upstream risk factors and mental illness, examining what is known, and laying a background for subsequent further investigation of the inter-relationship between the studies' dependent and independent variables. Chapter 2 is a review of recent research evaluating the association between such upstream factors as family history of mental illness in first degree relatives, adverse early experiences, individual coping strategies, socioeconomic environment, and mental illness. The focus of Chapter 2 is to examine the gaps in literature pertaining to upstream factors and the effect on the mental health of people in a low income setting like Nigeria where there is a dearth of literature, making the study significant in providing insight into an unexplored disease condition. Chapter 3 explains the methodology and design used in

the study. Chapter 4 highlights the results and the data analysis, and finally Chapter 5 provides a summary of the results, conclusion, and social implications of the study findings.

Chapter 2: Literature Review

Mental health is a state of well-being that may consist of one's psychological, emotional, and social conditions (U.S. Department of Health & Human Services, 2021) (citation). Several factors may influence mental health, including sociodemographic factors (age, gender, race and ethnicity, income level, education level, sexual orientation, and geographic location), family, community intricacies, and interpersonal, housing quality, social support, work, and school conditions (Healthy People2020, 2019). These factors may impact mental health either positively or negatively.

Mental illness in adult life cannot be separated from the adverse events that occur in early life, as well as individual's coping strategies, family and genetic predisposition, and socioeconomic status. Literature demonstrates the role of upstream risk factors, ranging from those that occur in early life (e.g., Babenko et al., 2015; Nestler et al., 2016; Newman et al., 2016), through more intermediate preventable causes like stress (e.g., Donovan & West, 2015), socioeconomic factors (e.g., Frasquilho et al., 2015; Lund et al., 2018; Shokouh et al., 2017), and family-related risk factors (e.g., Agerbo et al., 2015). Authors have also highlighted the role of intermediate psychobiological risk factors like biological, cognition, and behavioral predisposition have been identified in mental health disorders causation (e.g., Culbert et al., 2015). All these studies show the contributory roles of several individual factors to development of mental health disorders, each varying in degree and spectrum.

In contrast, studies have equally examined the more distal factors implicated in mental illness causation, including poverty (e.g., Rohde et al., 2016), environment (e.g.,

Fusar-Poli et al., 2017; Sharma et al., 2016; Wu et al., 2015), substance-related causes (e.g., Peters et al., 2015), education and income (e.g., Assari & Caldwell, 2018; Collins, 2016), trauma (e.g., Atwoli et al., 2015; Dunn et al., 2017) in mental illness causation. Although few studies have shown the interplay between these factors and how exposure to the factors are associated with risk of developing disease (e.g., Dargan et al., 2019; Fuller-Thomson et al., 2010; Yang et al., 2013), only limited studies have used the theoretical lens to examine the mediating role of socioeconomic disparities.

Often time the behavioral aspects of public and mental health are only considered after exposure to risk or causation has occurred. Better understanding of the upstream correlation factors could have positive implications for societal change. To clarify the interrelationships between these individual risk factors and mental illness causation, I examined the interplay between each risk factor, ruling out the contributory role of related socioeconomic burden.

Overview

This chapter commences with a brief review the theoretical framework used for this study, and dwells on a discussion of literatures on Rothman's sufficient and component cause model. I then examine studies that highlight the association between family, individual coping strategies, early adverse experiences in childhood and mental illness, highlighting how upstream risk factors interact with each other to affect individuals in regard to their mental health as adults. Following this discussion, I evaluate the contributory roles of socioeconomic factor, which is an important mediator variable measured in this study, to ascertain the true role of the independent variables on mental

illness risk. When applicable, connections between these variables and the domains of mental illness being studied are included. An examination of information that are closely linked to the present study forms the concluding aspect of this review of relevant literature.

Rothmans Sufficient-Component Cause Model

Explaining the relation between exposure and disease is critical precept in epidemiology. Although difficult to ascertain, a universal understanding of the notion of cause, causation, and causality is essential for a uniform agreement among researchers in public health to be reached. Associating disease with probable exposure or risk factors is not only essential for prevention, but for intervention of diseases (VanderWeele, 2017). The problem of finding a true causality is one that has existed since ancient Greek Aristotle proposed a 'theory of material, formal, efficient and formal causes' (Annas, 1982 as cited in VanderWeele, 2017).

Evolution in knowledge has involved investigation of cause, using induction and deduction by Bacon and Descartes (VanderWeele, 2017). Unfortunately, Hume (2000) denied the ability to effectively deduce cause through inductive methodologies, opening grounds for continuing search for objective truth about causality. Epidemiological transition in body of knowledge includes early account of the cholera epidemics in London by Snow (Zoccali, 2017). Snow' s reasoning was focused on identification of causes whose effects were immediately obvious. However, Snow's account falls short in proposing that when the cause of a disease is known, it precludes other factors from being

causes (Zoccali, 2017). By this, Snow suggested that only one known cause of a disease can exist.

The transition to the concept of multicausality as a basis for disease has been reinforced by novel examinations that discovered how chronic diseases result from multiple causal factors (Middelburg & van der Bom, 2015; Völzke, 2012; WHO, 2020b). Modern epidemiologists have come up with more accurate explanations of causation, emphasizing the complexity of the interactions that occur between social, behavioral, genetic, and other related factors on human health (Zoccali, 2017). Data in epidemiology can be used to explore the interactions between exposures to risk factors, hence supporting identification of causal mechanisms. A more detailed discussion to enumerate the full account of epidemiologic transition and investigation of the plethora of theories on relationship between exposure and disease may be beyond the scope of my study. However, more attention has been paid to the theoretical framework used in this study and how the model relates to other theories of multicausality.

The sufficient-component cause model has undergone significant attention and review. According to Marshall and Galea (2015). the model was introduced by Rothman in 1976 in response to discovery of the role of multicausality in chronic diseases etiology. Rothman's sufficient and component cause model, also referred to as the causal pie model, describes causal factors as "antecedent events, conditions, or characteristics that was necessary for the occurrence of the disease", such as those without which an event would not have occurred or take place later (Rothman & Greenland, 2005, p. 1). This presupposes that the risk has a direct and traceable effect on the outcome or event. ~~Add~~

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In forming a valid argument around the concept of cause or risk, it became imperative to view outcomes in relation to sufficiency and necessity, as against earlier probabilistic models of causality in epidemiology. Rothman's model contributed significantly to the in-depth consideration of what a cause is in epidemiology (Marshall & Galea, 2015). This has made it possible to answer questions around causality, a departure from the viewpoint of a time in history, when researchers were unfamiliar to modern understanding of risk factor approach to disorders (Herval & de Mello Rode, 2018).

The sufficient-component cause theory illustrates some very important principles, including multicausality, strength of a cause, interaction among causes, and the sum of attributable fraction for each component cause, which may not sum up to 100%. The central notion of the theory is that individuals are often susceptible to multiple diseases and that the outcome of each disease is multi-factorial, resulting from co-occurrence of several factors. The model also draws attention to processes, pathways, or mechanisms by which an exposure brings about a disease. For instance, the researcher may desire to know whether a mediator influences the causal relationship between exposure and disease (Chen & Lee, 2018). If indeed a mediator is involved, it then becomes important to breakdown the effect into a direct or indirect effect. According to Chen and Lee (2018), an indirect effect is that which is mediated by the mediator, while direct effect is that which is not mediated by the mediator.

Examining the relative risk of upstream factors using the lens of pathways permits integration of all information derivable from representative cases of mental illnesses that are sampled, and provides a good base for the conclusions that are derived from this dissertation. Particular attention is paid to ensuring a concise representation of variables, as well as exclusion of factors that are not essential. The Rothman's theory meets these objectives.

My dissertation used the constructs within the framework to examine the pathways that exist between upstream risk factors (exposure) like family history of mental illness in first degree relatives, adverse early experiences, and individual coping strategies; leading to the outcome, which in this study is mental health disorder. The study equally explored the mediatory role of socioeconomic status on the disease outcome. Since each participant may have multiple exposures, I computed a panel of causal-pie charts (which will sum up to 100%), for each of the individual effects of each exposure, as well as the interactive effects between the factors. The logical connections among key elements or exposure making are discussed in this chapter.

Rothman’s sufficient-component cause model is used to examine the causal pathways to mental health disorders, defining these pathways as minimal set of conditions and events that unavoidably result in mental health disorders (Berglund & Koski, 2019). Sufficient cause has been defined as the minimum set of cause enough to elicit a disease (Berglund & Koski, 2019). Setting a minimal limit presumes that none of the enumerated conditions is nonessential. Therefore, competition of a sufficient cause may be synonymous to the disease onset.

As a part of the construct, "component causes" are explained as important causes that are not sufficient on their own but are required components of one or more distinct sufficient causes (Rothman & Greenland, 2005). Component causes are also viewed as those that build up to make up a sufficient cause (Rothman & Greenland, 2005). It can therefore be said that when any component cause is absent from the minimal necessary set, the remaining component causes become insufficient.

The concept of causality, also known as causation, effect, or cause, helps the researcher to connect a set of variables (cause or risk factors) with another set of variables (outcome or effects; Chen & Lee, 2018). The association between two sets variables can be explained by the forward (in which variable is partly responsible for the second set) and a backward (the second, partly dependent on the first) relationship. Direct acyclic graphs (DAG) have been used to show this relationship between exposure and a disease, as well as the presence of a mediator (Chen & Lee, 2018). Similarly, I examined associations between the risk and outcome variables, in the presence of a moderator (socioeconomic status). Like studies by Chen and colleagues, I highlighted the direction of association between the variables in this dissertation.

An inference from the sufficient-component causal model is that when component causes do not interact together in distinct causal pathways, they usually produce additive effects whenever they occur in combination (Rothman et al., 2008 as cited in Patten, 2013). Yet when component causes interact together in causal mechanisms, they will be associated with greater than additive effects (Rothman et al., 2008 as cited in Patten, 2013). McLaughin et al. (2010) invoked this perspective in their study of interactions

leading to causation of major depressive disorder. The authors found that greater additive interactions exist between stress and childhood adversity, supporting the diatheses-stress modeling (McLaughlin et al., 2010Coleman et al. (2012) provided evidence of a greater than multiplicative interaction, (finding that recent incident of stress was predictive of depression, especially when individuals reported exposure to childhood trauma, compared to those who had no history of childhood trauma; and defined plausible pathways by which childhood trauma influences future effects. The authors described the moderating effect of resilience on relationship between childhood trauma and depression severity (Colman et al., 2012)

The null hypothesis under an additive model is that risks for each exposure add up additively $Risk_{A \text{ and } B} = Risk_{A \text{ only}} + Risk_{B \text{ only}} - Risk_{(\text{Neither A nor B})}$ (Zammit et al., 2010). According to Zammit et al. (2010), when exposed to A and B, if the risk is less or greater than additive, a statistical interaction occurs under an additive model. However, under the multiplicative model, a null hypothesis is achieved when risks for each exposure multiplicatively combines ($Risk_{\text{ratioA and B}} = Risk_{\text{ratioA only}} \times Risk_{\text{ratioB only}}$). Statistical interaction is achieved in a multiplicative model, if on exposure to both A and B, the risk is greater or less than multiplicative (Zammit et al., 2010). I examined statistical interactions under both additive and multiplicative models using both risk differences and risk ratios.

Literature Search

The literature search was done using relevant keywords that explore databases with associative studies by linking words /phrases including *upstream causative factors*

and mental illness, family history and mental illness, adverse life events and mental illness, individual coping mechanism and mental illness, and *Rothmans sufficient-component cause model* in varying combinations of the phrases. To get related journal articles and book chapters, the search involved the following databases: MEDLINE, CINAHL Plus, CINAHL & MEDLINE Simultaneous Search, PubMed, Academic Search Complete, Academic Search Premier, Education Research Complete, Professional Development Collection, MasterFILE Premier, PsycINFO, PsycARTICLES, and PsycBOOKS..

A further review of the references used in other articles was also helpful to gathering information on the adverse childhood experiences, coping strategies, family history and socioeconomic risk factors.

Adverse Childhood Experiences Model

ACE, otherwise known as adverse childhood events or childhood adversities refer to all types of abuse, neglect, and other potentially traumatic experiences which happen to people under the age of 18 (CDC, 2019; Kajeepeta et al., 2015, Nelson et al., 2017). Authors have also described ACEs as “any act or series of acts of commission or omission by a parent or other caregiver (e.g., clergy, coach, teacher) that results in harm, potential for harm, or threat of harm to a child” (Leeb et al., 2008; as cited in Hamby, 2017, p. #). These adverse events are often perpetuated by relatives, caregivers and other close individuals in the child’s growing up years. However, the effects of such negative events are lasting and may affect health outcomes in later life.

An individual's social condition, including their birth conditions and growing environment, may contribute to their health. According to Donkin et al. (2018), the place where people are born, live, learn, play, work, and age determines their functioning and quality of health outcomes. Several literatures have explained the fact that learning begins at birth; hence, the first few years of early life were believed to be most critical for development of an individual's brain (Kundakovic & Champagne, 2015; O'Mahony et al., 2017; Romens et al., 2015). It has also been discovered that many of the adult chronic diseases, including mental health disorders, can be safely adduced to processes and experiences occurring several years before manifestation of these diseases (Nusslock & Miller, 2016). In addition, over the years, the work of these authors has been dedicated to unearthing the role of early life in later development. These increasing clinical and epidemiological evidence indicate that early life events play very critical roles in later susceptibility to a number of chronic diseases.

A discussion on ACEs would be incomplete without an examination of abuse that happen during childhood. ACEs do not have to be traumatic or abusive, as even modest level of family dysfunction related to harsh or neglectful parenting may produce similar effects (Kelley et al., 2015). Furthermore, it is important to examine all the domains of ACEs, as other forms of ACEs exist, including household dysfunction (Björkenstam et al., 2016; Clemens et al., 2019; Felitti et al., 2019), criminality in families (Finkelhor et al., 2015) and intimate partner violence or parental separation (Choi et al.i, 2017; Mendonça & Ludermir, 2017). All these were examined and are iteratively discussed in this chapter.

Literature has shown that ACEs are often carried over into adulthood and can lead to emotional, cognitive, physical, social, and behavioral problems (Kajeepeta et al., 2015). According to CDC (2019), ACEs can also be associated with chronic diseases, risky health behaviors, low life potential, and early death. Authors have identified the relationship between ACEs and later symptoms of mood and anxiety disorders (e.g., Fernandes & Osório, 2015; Poole et al., 2017; Sachs-Ericsson et al., 2017), mental and substance use disorder (e.g., Choi et al., 2017; Mendonça & Ludermir, 2017), suicide, e.g., Comacchio et al., 2019), physical or psychological health (e.g., Bright et al., 2016; Nurius et al., 2015), and psychotic disorders (e.g., McGrath et al., 2017).

The Health and Human Services (n.d) described childhood abuse as "any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation" (para. 2). Only recently have researchers started to examine the association between childhood abuse risk behavior and diseases in adulthood (Felitti et al., 2019). Authors have also described strong associations between childhood abuse and severe mental illnesses (e.g., O'Mahen et al., 2015; Van Dam et al., 2015). Childhood abuse can range from physical abuse, sexual abuse, emotional abuse, to neglect by parent or older caregivers (Finkelhor et al., 2015). Physical abuse has been associated with chronic diseases and symptoms of adult depression, anxiety, and lifetime alcohol problems (Choi et al., 2017).

In later adult life, individuals with history of childhood abuse have been found to develop significant health risks such as: metabolic disorders (Davis, 2015), alcoholism, drug abuse, depression, suicide (Choi et al., 2017; Felitti et al., 2019); attention deficit

hyperactivity disorder (ADHD), post-traumatic stress disorder, bipolar disorder (Dunn et al, 2017; Smith, Goldstein, & Grant, 2016); psychotic disorder (Upthegrove et al., 2015). The study by Felitti et al. (2019), also underscores a strong graded relationship between childhood abuse and several of the multiple risk factors leading to death in adults.

The degree of abuse to which individuals are exposed may be related to their mental health outcome. In certain situations, childhood abuse has been solely implicated in mental health disorders (Van Dam et al., 2015). In such circumstances, higher frequency of abuse was associated with increasing odds of developing later mental health disorders in adult life (Sugaya, 2012). While controlling for other forms of childhood abuse, Kuo and colleagues (2015) similarly examined how frequency of childhood abuse determines severity of bipolar disorders, and demonstrated a unique association between childhood emotional abuse and BPD. This dose-response relationship further makes a case for examining the degree and nature of abuse (which can be single or multiple) in individuals identified to have a reported case of childhood abuse.

Often times the child is exposed to multiple forms of childhood abuse or risk factors, including household dysfunction (Felitti et al., 2019), trauma (Reininghaus et al., 2016), and sexual abuse (Maninglio, 2015). Just like Felitti et al. (2015), Kuo and colleagues (2015) had described the multiple dimensions of childhood abuse, but went further to describe the association with bipolar disorders. Although social scientists and psychologists have conducted extensive studies on the effect of long-term exposure and frequency of childhood abuse on children, not all studies showed the link to adult mental health (Felitti et al., 2019). Furthermore, several studies on long-term consequences of

childhood abuse have examined just one type of abuse (Felitti et al., 2019), especially sexual abuse; hence do not define the impact of more than one abuse (Paul & Eckenrode, 2015). Failure to examine the multiple dimensions of this factor may lead to a wrong attribution of a single type of abuse, such that cumulative effect of multiple categories of ACE is not assessed.

The current study avoids such wrong attribution by exploring all spectrum of childhood abuse, so as to reach a conclusively determination of their true association with mental illness in participants. The study will provide meaningful context about the interactions between these various forms of childhood abuse and with mental health disorders.

Emotional maltreatment, including abuse, as another form of ACE has been associated with mental health disorders (Taillieu et al., 2016). According to the Administration for Children and Families, emotional maltreatment or abuse has been defined as "a pattern of behavior that impairs a child's emotional development or sense of self-worth. This may include constant criticism, threats, or rejection, as well as withholding love, support, or guidance" (Nesheen, Alam & Nazir, 2015; p 1). Children born to families where there is interpersonal violence, poor social support and who have been subjected to emotional abuse exhibit later mental health disorders in adulthood (Maninglio, 2015). Exposure to emotional maltreatment early in life can then be linked to later manifestations of mental health disorders.

Emotional maltreatment can be either active (emotional abuse) or passive (emotional neglect; Taillieu et al., 2016). Taillieu and colleagues found greater incidence

of emotional neglect (6.2%) among the population sampled in their study, compared to abusive acts or emotional abuse (4.8%). However, both forms of maltreatment can coexist in families. About 3.1% of the sample in Tallieu's study had undergone both forms of maltreatment (Taillieu et al., 2016). Therefore, mere absence of frank signs of emotional abuse does not rule out maltreatment. These findings indicate the importance of paying attention to less overt manifestation of neglect to come to conclusive decisions about or rule out emotional maltreatment in subjects.

Taillieu's study highlighted the significant association between emotional maltreatment, especially abusive acts and increased odds of almost every mental health disorder assessed in this study (Taillieu et al., 2016). Authors describe the association between childhood emotional abuse and sleep disorders in later life (Kajeepeta et al., 2015), depressive symptoms (Cheong et al., 2017; Paul & Eckenrode, 2015), anxiety and paranoia (Fernandes & Osório, 2015), suicide attempts (Aas et al., 2017), psychotic symptoms (Longden, Sampson & Read, 2016), joint anxiety and psychotic symptoms (van Nierop et al., 2015), and physical health (Widom, Horan, & Brzustowicz, 2015).

Recent studies have shown that beyond childhood abuse, other range of adversities predict several forms of mental illness. These adversities have been found to include: ill-health in the mother and extreme stressful conditions during pregnancy (Babenko, Kovalchuk, & Metz, 2015), poor nutrition and unplanned pregnancy, early parental loss through death and abandonment, experience of parental violence, dysfunctional parenting style, criminal behavior in parents, parental substance abuse, and mental illness in parents (Neger & Prinz, 2015; Ofonedu, Maepa, & Idemudia, 2015).

Families that experience continuous violence may adjust to such circumstance over time. However, children that are born into such dysfunctional households in later life are prone to poor mental well-being and low life satisfaction (Hughes et al., 2016), self-harm (Björkenstam, Kosidou & Björkenstam, 2016), and in a few instances manifest even physical ailments like coronary disease and stroke (Gilbert et al., 2015). Hughes and colleagues established a strong cumulative relationship between childhood dysfunctional household and adult mental well-being (Hughes et al., 2016) There is a collective agreement between these authors that household dysfunction affects the health of children in later life. Given the importance, an examination of the dimensions of household dysfunction is essential.

Psychologists have examined childhood household dysfunction using the lens of marital disharmony, criminality in parents, and drug abuse (Anda, et. Al, 2007). According to Björkenstam et al. (2016), other childhood household dysfunction spectrum may arise from death in the family, parental substance abuse and mental illness, parental somatic disease, criminality in parents, marital separation/single-parent household, unstable residence and public assistance receipt. All of these risks may act solely or collectively to contribute to health outcomes in victims.

An examination of literatures shows a growing link between households affected by mental illness and poor mental health in children that grow in such homes (Pitkänen et al., 2019; Van Loon et al., 2015). Scholars have suggested this is due in part to genetic risk factors that predispose the offspring of people with mental illness to poor mental health themselves (Lam, 2015; van Santvoort et al., 2015). Gene methylation has been

implicated more in psychotic illnesses, but is less defined in emotional disorders (Pine & Fox, 2015). Conversely, Joseph (2013) disputed the role of genetic explanations in the transmission of mental health disorders in families. This conflict in thoughts, underscores the need to explore alternate explanations. The risk of developing mental illnesses in children with history of parental mental illness has also been adduced to other factors. Reupert and Maybery (2016) demonstrated relationship between onset of mental illness in the offspring born to families with parental mental illnesses, and correlation with parent's mental illness. Literatures have equally highlighted possibility that the negative mental state in parents interact with factors like substance abuse, genetic susceptibility and epigenetic processes (Neger & Prinz, 2015; Yeshurun & Hannan, 2019). The pervasive association between parental mental illness and later childhood illnesses is reinforced by proof that when interventions are targeted at reducing the debilitating effects of the illness, there is decreased risk of the children developing the same mental illness (Reupert & Maybery, 2016).

Parents who have been exposed to some of the adverse experiences early in childhood may find it difficult to provide an optimum environment for their children. Households affected by mental illness, especially parental mental illness; could experience disruption in care pattern, as well as parental stress and abuse (Ranning et al., 2015). Such an exposure can be associated with increased risk of mental illnesses in the offspring (Ranning et al, 2015). Marshall and colleagues found an interesting link between parental bonding and attachment in children born to households with parental mental illnesses, and later adjustment quality of mental health outcomes and interpersonal

functioning in adult life (Marshall et al., 2018). In addition, mental illness can have broader impacts on social and emotional development of a child; especially when parenting practices are hindered by factors such as lack of emotional warmth, decreased responsiveness, weakened attention and erratic patterns of behaviors in caregivers (Fiske, 2015; Žukauskienė & Malinauskienė, 2015). Understanding the pathways to poor care pattern in families with parental mental illnesses, as well as their contributory role to development of negative mental health outcomes in later life, may provide a better view of how to halt the incidence of mental health disorders in families.

The poor outcome in offspring from homes affected by mental health disorders may be attributed to several factors. Lack of care resulting from poor mother-child relationships as experienced in households with parental mental health disorders may be due to psychological (as seen with failure of attachment or poor caregiving) and physiological factors, and may result in distal mental health disorders like anxiety (Schimmenti & Bifulco, 2015). There is also growing evidence that supports the role of environment (i.e., in which a child grows) and its impact on all aspects of an individual's development; both physical and psychological (Lubans et al., 2016; Tost, Champagne, & Meyer-Lindenberg, 2015; Wells, Evans, & Cheek, 2016). Uher and colleague attempted to highlight the human biological pathways that are affected by exposure to negative behavioral environments (Uher & Zwicker, 2017). The research emphasizes the primal interaction between environmental and genetic risks and efficacy of gene-environment relationship in causation of most types of psychiatric disorders (Uher & Zwicker, 2017).

The pathway to the negative outcomes in affected children can then be traced to both intrinsic and extrinsic factors in the family.

Children that witness violent treatment of their mothers may often be helpless, but are likely to retain memories that live with them through life. IPV damages the internal working models of the woman survivor in such a way that the children born to or present in such homes are often negatively influenced by adverse models in their romantic relationship (Weaver & Schofield, 2015). Weaver and colleague are in agreement with other authors about the influence of negative relationship and internalizing abilities on parenting behavior of the woman survivor, and in turn the development of internal working models in her child; eventually leading to poor emotional and behavioral regulation in children from such families (Gilroy, McFarlane, Maddoux, & Sullivan, 2016; Katz, Stettler, & Gurtovenko, 2016). Knowledge of the mechanisms involved in perpetuating negative outcomes in victims and their offspring could strengthen interventions to mitigate IPV.

The mechanisms by which mental health outcomes in later life are linked to early exposure to IPV may provide insight into how victims respond to and transmit the trait to the children. This impairment of internal working models resulting from IPV can be passed across generations, negatively influencing the emotional and social function in children from such families (Martinez-Torteya et al., 2017). Theorists have also adduced these poor internal working models to failure of attachment in individuals, which are projected to their romantic relationships in adulthood (Smagur, Bogat, & Levendosky, 2018; Weaver & Schofield, 2015). The working models also involves expectations from

these relationships; which stimulate discriminatory attention for expected interactive patterns, hence reinforcing these expectations (Plant et al., 2015). Authors have observed that during childhood, the working models and expectation of caregiving in an adult marital relationship is more profound when undergoing stress conditions, where the need for interpersonal security intensifies (Plant et al., 2015.

The mother-child attachment or bonding may be essential for the development of a child. Attachment behaviors begin at birth and evolve over time, but is often useful for purpose of the supporting the child to get protection and care (Borneman, 2016). However, majority of the caregiving systems develops to maturity in the mother during pregnancy from relations between physiological and psychological changes accompanying pregnancy, hence the mother-child relationship begins during pregnancy (Warnock et al., 2016). Warnock describes this attachment system as complementary to the caregiving systems (Warnock et al, 2016). The interesting dynamics is seen in how this complementary function evolves. The attachment system is developed to provide protection by bringing the child closer to the caregiver, while the caregiving system then develops to provide the needed protection; hence ensuring survival of the child (Moreira & Canavarro, 2015). These findings buttress the primal role of these filial bonds in families and their influence on mental distal mental health outcomes.

The psychological relationship that develops in pregnancy simultaneously develops with physiological relationship beginning at conception through birth and beyond (Warnock et al., 2016). According to Warnock et al. (2016), these physiological, emotional, and behavioral parameters develop in mothers during breastfeeding. Scholars

have demonstrated that this physiological connection between mothers and the unborn baby is another mechanism that underlines the effect of IPV during pregnancy on the developing fetus; adducing the role to prenatal programming of the hypothalamus-pituitary-adrenal (HPA) axis, which is a major system that modulates the body's response to stress (Glover, 2015; Martinez-Torteya et al., 2016). This is reinforced by evidences that IPV has both psychological and physiological consequences on the relationship between mother and child (Alhusen et al., 2015; Cummings & Miller-Graff, 2015; Delara, 2016; Sugg, 2015). The role of the HPA axis was further reinforced by Davis (2015), who found a significant association between trauma in childhood and high blood pressure. Interestingly, there was no significant association between childhood trauma and metabolic syndrome (Davis, 2015). The combined psychological and physiological pathway is one that buttress the multiplicity of risks in mental health disorders.

When children are born to households in which one or both parents have a history of crime or have been incarcerated, they have a tendency to be exposed to hostile experiences growing up. Although a lot of work has been done on the effect of intergenerational transmission of criminality, only recently has researchers started paying more attention to the extent of impact parental incarceration plays on children (Haskins, Amorim, & Mingo, 2018; Martin, 2017). Beyond the earlier narrative, explaining ACEs as majorly related to abuse and neglect in childhood, growing body of knowledge highlights the role parental incarceration plays in the mental health outcome of children (Arditti, 2016; Gaston, 2016; Miller and Barnes, 2015). As criminality increases worldwide, increasing number of children experience parental incarceration (Haskins,

Amorim, & Mingo, 2018). Following incarceration of their parents; the families or children who are born to them experience several difficulties, including stigma, strained parenting, poor childcare arrangement, loneliness, traumatic separation, and poverty/reduced income (Muentner et al., 2019). When children are exposed to parental incarceration early in life, they are more prone to experiencing economic instability, financial strain and frequent changes in residence, (Foster & Hagan, 2017; Hardy, 2018), and aggressive behaviors than their peers (Martin, 2017). Children's exposure to these adversities early in life may have lingering internalizing effects on the development and consequent effects on their health.

Researchers have established evidence of causality by studying intra-family changes in families whose parents are absent for other reasons, as well as population of children who are disadvantaged generally, to examine the effects of incarceration on child aggression (Haskins, 2015; Martin, 2017). These researches, and findings from studies by Shaw, Bright and Sharpe (2015), offers support for the argument that paternal incarceration increases children's physical aggression. These population-based findings suggest that children of incarcerated fathers are at significant risk for problems during early childhood.

Children born to families with history of criminality, often had stressful life events prior to parental incarceration. Such children are often at risk of a number of adverse behavioral problems. Miller and Barnes (2015) showed a consistent association between parental incarceration and later antisocial behavior in children, mental health disorders, and poor educational performance. Miller and Barnes (2015) demonstrated that

individuals that grew in home with incarcerated parents (especially the father) were often less likely to complete college, and reported dissatisfaction with their educational achievements. A significant number of the individuals showed signs of either depression or panic disorders (Miller and Barnes, 2016). Children of incarcerated parents are therefore expose to social ills, and later behavioral problems or mental health disorders.

The association existing between parental incarceration, child sleep, and eating disorders (Jackson & Vaughn, 2017); development of youthful criminality/aggression, antisocial behavior, substance use, and poor academic performance (Forrest-Bank & Jenson, 2015) have also been investigated. Children that grow in families that have experienced negative social events like parental imprisonment from criminal offences, may have even more profound effects appearing in later life. In addition, studies have demonstrated an association between parental incarceration, future drug use, depression (Kopak & Smith-Ruiz, 2016), as well as stress (Arditti, 2016). Interestingly, authors have shown the relationship between parental incarceration, risk for physical and mental health disorders (Turney, 2017), as well as education and economic outcomes in young adulthood (Miller & Barnes, 2015). These results highlight the multiple debilitating outcomes in children born to incarcerated parents.

Divorce and parental separation are often traumatic events. Disparities in outcomes for children born to separated families have been to be associated with frequent history of depression, violence, breakdown in learning and social functioning, and risk of suicide (Haimi & Lerner, 2016). According to Haimi and Lerner (2016) the process of divorce in itself affects the state of physical illnesses of the children. The relatively poor

attention and care received by children born to families experiencing parental separation may affect their outcome in later life (Seijo, Fariña, Corras, Novo, & Arce, 2016). Although, the quasi-experimental model used by Seijo et al. (2016) reinforced the increased likelihood for children of separated parents to progress to have poor mental health in later life, compared to children of intact families. Authors have also reported health-related consequences, ranging from poorly defined behavioral problems (Weaver & Schofield, 2015), to suicidality (Lindström & Rosvall, 2015), mood disorders like panic and generalized anxiety disorders (Newman, Shin, & Zuellig, 2016; Zhang et al., 2015), and substance use disorders (Choi et al., 2017). There is a collective agreement by authors in the above literatures, that parental separation in childhood increases the chances of later illnesses in adulthood.

This study does not include all the different forms of ACEs described in literatures above, and where consistent, elucidate associations that exist with mental health disorders. To effectively demonstrate this association, and make conclusive inferences about the statistical relationship between ACEs and mental health disorders; it is important to rule out other confounders like individuals' coping strategies, family history of mental illness, and environmental factors that may distort any associations.

Coping Mechanisms

There have been considerable arguments about the true definition of coping (Algorani & Gupta, 2021; Baqutayan, 2015). However, slowly emerging consensus appears to support the fact any definitions must include the following key concepts: purposefulness, volitional efforts, regulation of self and environment; to have an optimal

description of coping (Compas et al., 2017; Kraaij & Garnefski, 2019; León, Núñez, & Liew, 2015). Coping has also been defined as, “conscious and volitional efforts to regulate emotion, cognition, behavior, physiology, and the environment in response to stressful events or circumstances” (Kraaij & Garnefski, 2019, p 1). The consistent themes from these definitions are the connection between coping and the regulation of emotional and functional processes, including emotion, behavior, and cognition, and equally important is the attempts to regulate relations with others and the environment (Compas et al., 2017).

Every individual would be exposed to stressful life events at one point or another in their lives. An individual’s ability to effectively navigate these existential challenges of life is premised on unique internal mechanisms which can be cognitive, affective, motivational or behavioral in nature (Compas et al., 2017). At optimal capacity; individuals are able to adapt to divergent circumstances, play different roles, with minimal risk of impeding thoughts, maintain a balance between emotional distress and realistic problems, and can have his or her goals facilitated, rather than impeded by these occurrences. The internalizing forces like cognitive, motivational, affective, and behavioral systems in individuals help them to meet basic needs of life and equip them with strategies that protect them from interpersonal or physical harm (Kraaij & Garnefski, 2019). The affective or emotional systems serve as the building block of life, providing the emotional capability to develop and maintain friendships, and generate such externalizing influences as: pleasure (which rewards activities that are promoting in nature), anxiety which signals danger, sadness to highlight defeat or loss, and anger in

response to offences (Kraaij & Garnefski, 2019). When these adapting systems are disproportionately activated, relative to the life events, there is a risk of developing varying levels of psychological problems that manifest as a disorder (Borsboom, 2017). All of us rely on a wide range of these adaptive or coping strategies in our daily living. Our reactions range from avoidance or withdrawal from sudden challenges that we wish to avoid, running away from life threatening situations, worrying incessantly about the problem; until a solution is found or we succumb to unresolvable challenges (Borsboom, 2017). The scenario described above underscores the complexity of the stress events and individual innate response to these conditions.

Psychological adjustment may be linked to the individuals' ability to adopt a flexible response to situations. Park, Chang, and You (2015) suggested that coping effectively with traumatic situations can be facilitated by two distinct processes. First is the forward focus, which is enabled by ability to create alternative thoughts about the problems, retain goals and plans, remain calm, appease the distressed feelings, continue to be cheerful, generate positive thoughts, and be sensitive to the needs and wellbeing of others (Bonanno, Pat-Horenczyk, & Noll, 2011; as cited in Park, Chang, & You, 2015). The trauma focus lends itself to social avoidance, focuses on traumatic event, learning from its emotional and cognitive significance, and building realistic thoughts; in such a way that individuals are able to amend their goals/plans (Bonanno, Pat-Horenczyk, & Noll, 2011; as cited in Park, Chang, & You, 2015). Inappropriate use of coping strategies when facing clinical or life problems, may result in individuals becoming dysfunctional.

All individuals have innate beliefs which guide their thoughts and actions. The meaning attached to these situations can be traced back to the individual's belief systems (Galek et al., 2015). The meaning attached to situations is triggered, as individuals derive meaning from their belief system (Galek et al, 2015). Our belief interacts with other cognitive, affective, motivational and behavioral systems (Compas et al., 2017). A biased belief system is built on a continuum that ranges from adaptive to maladaptive (Sirois & Kitner, 2015). With increasing level of bias, a point is reached where the internal coping mechanism are overwhelmed, increasing the chances of experiencing a clinical disorder (Galek et al., 2015).

The ability to cope with life experiences may be premised on an individual's awareness and problem-solving capability. A fascinating thing about human cognition is their capacity for intellectual control, as well as opportunity to regulate and order thoughts and actions based on internalized behavioral goals (Heleniak et al., 2016). Cognitive systems include all processes by which an individual become aware of situations, needs, goals and action; and use such to solve problems for optimized living (Tremblay, 2017). This is the reason cognition is of primal importance in regulation of other forms of behaviors (although relationship is not causal in nature) (Tremblay, 2017). According to Tremblay (2017), cognition is premised on well-developed situational awareness. Situational awareness has been directly linked to understanding the needs and goals that lead to action (Kruglanski, Shah, Fishbach, & Friedman, 2018). Individuals may need to develop these mechanisms for assessing goals, in order for adaptation to become much easier to achieve.

Cognitive models, like other theories, may provide a lens to understanding the basis for human adaptation and response to life experiences. Cognitive theories, therefore present the most compelling argument to understand the causation of mental health disorders such as post-traumatic stress disorder (PTSD) (LoSavio, Dillon, & Resick, 2017), anxiety (Leahy, 2015), and other forms of adult mental health disorders (Power & Dalgleish, 2015). Park and her colleagues worked extensively on different theories and concluded that an individual's belief, comprises of both his central belief and hierarchy of goals (Park et al, 2012). In fact, there is proof that distress is more strongly associated with violation of goals than belief violation (Park, 2008; as cited in Park et al, 2012). Such disruptions increase individual's vulnerability by violating all known beliefs of safety, hence activating their fear networks (Park et al, 2012). Cognition then presents a major argument for the risk pathways to disruption in mental health.

The intersection between cognition and mental health disorders may be a subject of interest especially with increasing interest in causation. Study results have demonstrated the link between reduction in cognitive capability and higher risk of mental health disorders like psychosis (Marioni et al., 2015). In fact, there have been arguments that cognitive deficits are integral to causation of schizophrenic disorders (Khandaker et al, 2015); though evidences show they may be associated with a wider spectrum of psychiatric disorders (Hu et al, 2014). Similarly, population-based studies have revealed strong links between cognitive ability and common mental health disorders like personality disorders, depression, substance disorders, and adjustment disorders (Bora & Pantelis, 2016; Möller et al, 2015; Sloan et al., 2017; Strunz et al., 2015). Results from

these literatures highlight the overwhelming evidence of the linkage between cognitive decline and most mental health disorders, hence strengthening the role of cognition in intellectual development.

A number of pathways linking cognition with mental illnesses have been postulated. From the perspective of neurobiology, major quantitative reductions in neuronal materials have been suggested to result in lower threshold, leading to functional impairments (Daulatzai, 2015). Furthermore, individuals with subliminal cognitive reserve are less able to use their problem-solving skills, or seek help when needed in stressful situations; and these could aggravate their already compromised risk for mental health disorders (Jacob, 2015). On the other hand, impairment in cognitive ability may result from presence of mental health disorders, especially with disorders that have an onset in young adulthood, and which may lead to educational disruptions (Wagner et al., 2015). Aside this direct relationship between cognition and mental health disorders, there may be a possibility of co-existence with other forms of defective coping systems.

There should be a compelling relationship between emotional and cognitive systems, especially since the way an individual perceives an experience or situation may determine the nature of behaviors and feeling he/she will exhibit in the context of such situation or experience. Dysfunctional thoughts and distortions in cognition have been associated with negative emotional states and harmful behaviors (Wyssen et al., 2016; Kuru et al, 2018; Da Luz et al, 2017). Da Luz et al. (2017) links these cognitive distortions in adulthood strongly with early maladaptive thoughts processes and further highlights the relationship to mental health status. Paying attention to elucidating the

relationship between emotional and cognitive systems may support identification of underlying pathways to mental disorders.

Navigating the life's challenges may require a recourse to internal or external mechanism that stimulate the individual to act, so as to accomplish goals. These internal mechanisms, otherwise referred to as 'motivation', can be considered an aspect of cognition; as they provide a better description of quality of affect than of thought (Westbrook & Braver, 2015). Farris et al. (2016) suggests that the human tendency to respond with fear to anxiety-related situations, as well as the inability to endure distressing psychological or physical states are associated with mental health disorders like substance use disorders. The finding by Farris provides a good argument for classifying motivation as a crucial link to achieving a stable response to stressful situations (Farris et al., 2016). I used the tool in this study to measure participants' response and ability to understand their health state, and change the situation, so as to have a good understanding of their motivation to cope with the mental health disorder (e.g., Farris et al., 2016).

Understanding the pathways from distress to symptomatology will be helpful. Evolution in knowledge shows that a broader perspective is needed to understanding the way symptoms develop when people face distress situations (Sirois & Kitner, 2015). According to Sirois and Kitner (2015), distressing reactions or disorders should be viewed in the context of adaptation or failure of the adaptation mechanisms. Other scholars underscore the relevance of emotional regulation in etiogenesis of mental health disorders (Baglioni et al., 2016; Schäfer et al., 2017). According to Racine and Wildes

(2015) deficits in emotion regulation appear to contribute to and be relevant to the different stages and forms of psychopathology, ranging from development stage, through maintenance, and treatment. There is substantial evidence of the relationship between weakness in adaptive coping skills, emotional challenges and clinical outcomes like: depression, substance use disorders, eating disorders, borderline personality, somatoform disorders, and diverse other psychological manifestations (Perreault et al., 2017; Schäfer et al, 2017; Wilcox, Pommy, & Adinoff, 2016).

Family history has been demonstrated to confound the relationship between cognitive ability and mental health disorders, especially since it contributes to mild impairment in cognitive ability, and an increased risk of psychiatric disorders (Bora, 2015). This convergence, emphasizes the importance of elucidating the relative contributory role of family history, before making substantive determination of true risk of mental health disorders.

Family History

Aside causation from environmental factors, like loneliness or adverse life event and others, mental health disorders may be passed on to close family members. Evidence from both epidemiology and genetic studies show shared genetic factors are responsible for most mental health disorders (Bora, 2015; Romens, McDonald, Svaren, & Pollak, 2015). Genetic predisposition has also been shown to determine outcome (Bora, 2015). High polygenic risk has been associated with more severe mental health symptoms and increased need for hospital admission, and DRD2 gene 141C insertion fund to amplify positive symptoms in clients with schizophrenia (Meier et al., 2016). Mental health

outcome is also influenced by factors like family environment, as demonstrated by good response to antipsychotic treatment (Ezeme et al., 2016). It can then be surmised that family history of psychiatric disorders has both genetic and environmental effects. This makes a case for investigating the influence of family history on mental health outcome.

It appears individuals with family history of mental health disorders have higher chances of developing the disorder. According to Garcia et al. (2017), the presence of mental illnesses in parents is a risk for developing children and may be attributable to the existence on mental health disorders in such children. Children of parents with severe mental illnesses were found to have a greater risk of developing mental illnesses (Agerbo et al., 2015). Hence, the severity of mental illnesses in a parent may predict outcome in the offspring.

Family history of mental illness has been associated with various forms of mental health disorders. Schizophrenia has been exhaustively investigated and established to have direct genetic causation (Agerbo et al., 2015; Bigdeli et al., 2016; Neale & Sklar, 2015; Ran et al, 2017). Ran and colleagues, showed a strong association between history of disorders in family and onset of schizophrenic illness (Ran et al, 2017). Ran et al. (2017) demonstrated that individuals with family history of schizophrenia were likely to contract disease at a younger age and have poorer long-term outcomes (such as higher rate of homelessness). The findings by Ran are similar to those from other authors like Cheng et al., 2018, who found even closer association between clinically diagnosed schizophrenia and broader range of mental health disorders in first degree relatives. The study showed greater associations in first-degree relatives than was previously reported

(Cheng et al., 2018). The authors concluded there are risk haplotypes shared across several disorders, as well as environmental factors which cluster in families (Cheng et al., 2018).

The presence of mental health disorder in the parent or sibling may be a risk for other spectrum of mental health disorders in affected individuals. There is increasing evidence of the genetic link between mental disorders, such as schizophrenia and autism (Pina-Camacho, Parellada, & Kyriakopoulos, 2016). Aside the fact that these two disorders have a shared neurobiological basis, they have some connection in their clinical and cognitive deficit (Pina-Camacho, Parellada, & Kyriakopoulos, 2016). Yap & Jorm (2015) found that the presence of schizophrenia in a first degree relative is associated with autism spectrum disorder. Other authors have also linked this association to similarities in etiologic factors for schizophrenia and mental health problems like autism (Charman et al., 2017; Bijl. et al., 2015) and attention deficit hypersensitivity syndrome (Ghirardi et al., 2018). These findings indicate the possibility for individuals to develop other forms of mental health disorders, when they have a primary disorder.

Additionally, parental and maternal history of major depressive illness has been associated with two times probability for their offspring to require treatment for the disorder, compared to individuals without any such history (Leijdesdorff et al., 2017). Other literatures have equally buttressed the link between family history and depressive illness (Manczak, Williams, & Chen, 2017; Otto et al., 2016). Melton et al. (2016). These authors concluded that the existence of a mood disorders and suicide or comorbidity of both illnesses in families, is a significant risk for a comorbidity with several anxiety

disorders. Interestingly, an inverse relationship has been reported between family history of these mood disorders and age of onset in offspring (Preisig et al., 2016).

Genetic and familial environmental factors have significant influence on other forms of mental health disorders like substance use disorders (Nestler et al., 2016). While substance use disorders have complex etiology, Nestler et al. (2016) identified the role of diverse forms of genetic risk in their causation. The authors suggested that though substance use disorders are influenced by environmental factors like marital disharmony/instability, as well as criminal behavior in foster homes or psychopathology; these adverse factors are more severe in situations where there is existing genetic risk (Nestler et al., 2016). Marmet et al. (2018) agrees with Lester and colleagues, that behavioral addiction and substance use disorders often result from underlying vulnerabilities; suggesting the existence of different levels of vulnerabilities to addictions. Marmet and colleagues concluded in their study that vulnerabilities have strong associations with patterns of family background, personality and mental health factors (Marmet et al., 2018).

Family history has also been demonstrated to act together with socioeconomic risk factors to cause mental health disorder (Agerbo et al., 2015). This highlights the need to investigate the contributory role of socioeconomic risk factors. My dissertation examines the role of family history in first degree relatives, coping strategies, and ACEs as risk factors among two of the most prominent socioeconomic groups in the study area.

Implications of Socioeconomic Status on Mental Health

There may be a close link between social classifications and economic circumstances in which people live. SES can be explained as the social categorizations that describes the differential experiences and life conditions which has implications on health (Williams, Priest, & Anderson, 2016). The common set of indicators used to measure SES, including income, occupational status, education, are among the strongest determinants of the difference we see in health outcomes (Marmot & Allen, 2014).

An understanding of how socioeconomic conditions are distributed across societal strata may provide inferences on etiogensis of mental disorders. There is a general agreement that mental health disorders are unequally distributed across different economic/societal strata and socioeconomic groups (Assari & Caldwell, 2018). According to Assari and Caldwell (2018), individuals within the lower SES are more exposed to developing mental health disorders. This socioeconomic gradient and its influence on health are documented (Bradshaw et al., 2017; Hajizadeh, Mitnitski, & Rockwood, 2016; Hong, 2018). Identifying these social gradients will support our understanding of the pathways to disease.

Some researchers argue that social factors like income inequality and poverty may be the root cause of mental health disorders, as individuals are unable to access resource that are needed to live a healthy life (Burns, Tomita & Kapadia, 2014; Pickett & Wilkinson, 2015). Ribeiro and colleagues found that poor household economy was a consistent predictor of mental health disorders (Ribeiro et al., 2017). Interestingly, level of education attained by the parent, is equally strongly related to externalizing than

internalizing disorders (Newland, 2015). Conversely, the secondary review of data from a national survey involving over six thousand United States adolescents found that parent education reduces risk for anxiety disorder (McLaughlin et al., 2012). McLaughlin and colleagues found that relative deprivation was even more predictive of mood disorders than parental education (McLaughlin et al., 2012). The difference in findings may be due to variance in age of the study participants. However, conclusive evidence from these two studies highlights the strong association between SES and mental health disorders.

Social circumstances limit individual's health and life choices and may be linked to mental health disorders. Evidence has shown causal relationships between mental health disorders and unemployment and suicide (Frasquilho et al., 2015), social displacement from violence (Miller & Rasmussen, 2017), and culture and ethnicity (Kirmayer & Ryder, 2016). The large population study conducted by Laanani, Ghosn, Jougla, and Rey (2015) established a dose–response relationship or true causal influence of unemployment on suicide. The study by Laanani et al. (2015) showed there was a statistically significant relationship between unemployment and suicide rates in the countries in the investigated countries. The relationship between mental health outcome and SES has been defined in the context of inter-relationship with race/ethnicity, involvement in cultural activities (Collins, 2016; Kirmayer & Ryder, 2016), occupation (Joyce et al., 2016) and poverty (Burns, 2015). William and colleagues highlighted the complex ways race/ethnicity combines with SES to affect health (Williams, Priest, & Anderson, 2016). It is therefore important to understand the contributory role of factors

like race, culture and income and others to etiology of mental health disorders in order to prevent them from masking the true association that exists.

Unemployment will likely affect mental health in many ways. Past meta-analysis of over 140 studies indicated that job loss leads to worsening mental health, and improves when the individual is re-employed (Paul & Moser, 2009). Further consideration highlights the possibility that mental disorder mediates or exist on the causal pathway between suicide and unemployment (Laanani et al., 2015). Authors had also identified the need to consider mental health disorders as a cause, rather than a consequence of unemployment (Mojtabai et al., 2015; Schaller & Stevens, 2015). Theories of social causation equally identifies changes in employment and increasing work demand as a predictor of poor health outcome, and is consistent with the thought that job loss can lead to changes in mental health outcome. (Bakker & Demerouti, 2018). Social circumstances like unemployment can then be a cause or effect of mental health disorders.

The social behavior and norms found in a society defines its culture, and encompasses the spectrum of phenomenon that is learned and transmitted. Therefore, culture has been described as all-encompassing phenomenon that is related to human interaction, identity, language, norms, and is central to anthropology (Delaney, 2017). There are growing global debates about the applicability of mental health categories to cultural factors (Nesse, 2015). Tajan defines differing cultural concepts of distress (CCD) which relates to the way “cultural groups experience, understand, and communicate suffering, behavioral problems, or troubling thoughts and emotions” (Tajan, 2015;

p.328). In the presence of favorable environment, culture may contribute to health outcome.

The influence of racial discrimination on psychopathology becomes more evident in the face of the disparities in mental health outcome between racial minority groups and those with social advantage. Assari (2017) found that individuals exposed to racial/ethnic stigmatization experience higher rates of illnesses, deterioration in quality of health and death within their communities in the United States and even globally. Racial discrimination has been found to predict such mental health disorders as major depressive disorder, posttraumatic stress disorder, panic disorder with agoraphobia, substance use disorders in minority groups in the United States (Assari et al., 2016; Rodriguez-Seijas et al., 2015; Sutter, & Perrin, 2016). Race relations then remains a major determinant of mental health outcomes.

Adverse Childhood Experiences, Coping, Family History and Socioeconomic Status

Limited literatures have examined the link between mental health disorders and risk factors, especially from the perspective of the inter-relationship between these factors. It is helpful to explore the true attribution of each of these risk factors, but more importantly understand the minimal set of conditions necessary for these factors to interact and cause disease. This study explores pathways to mental health disorders, by understanding the relationship between component upstream risk factors like family history of mental illness in first degree relatives, adverse early experiences and individual coping strategies and mental illness. These relationships were tested using the lens of the Rothman's sufficient and component cause model.

Most studies examine the individual contributory role of mental health risk factors to onset of disease. However, only few elucidated the inter-relationship that exists between these factors. Only few studies show the influence of co-existing risk factors on etiology of mental health disorders.

Distal Risk Factors for Schizophrenic and Mood Disorders

Distal risk factors have equally been identified to differ between schizophrenia, bipolar, and major depressive disorders (Bruni, et al, 2018). However, authors have suggested that sometimes these distal factors are similar in the way they influence outcomes in different groups of mental health disorders (Botti et al., 2018; Karpov, et al., 2016).

Social determinants of health are distal factors predisposing individuals to developing mental disorders (Lund, et al., 2018). Studies have shown that the demographic factors have similar outcomes in depression, anxiety, substance abuse, psychosis, child and adolescent behavioral and developmental disorders, and dementia (und, et al., 2018). In addition to these disorders, the economic domains to which an individual is exposed, influences childhood internalizing and externalizing disorders (Lund, et al., 2018). According to Lund, et al. (2018), outcomes like adolescent substance abuse, and externalizing behaviors have been discovered in individuals that are exposed to adverse neighborhood factors. It is then important to understand how some of these distal factors contribute to etiogenesis of mental health disorders.

Methodology

In this study, I use a quantitative research method to deductively examine the relationship between upstream exposure/ risk factors and mental health disorders. Linear and logistic regression were used to develop the additive and multiplicative models respectively. The methods used in this study, including interviewer administered questionnaire and linear/logistic regression modelling, will involve use of combinations of predictor variables to assess interactions on the additive scale. Just like this study, Patten (2013) had used logistic regression to examine the interactions on a multiplicative scale. Patten (2013) carried out further Wald tests to investigate the significance of cross-product interaction terms in the logistic regression models.

According to Creswell and Creswell (2017) quantitative technique allows the researcher to make beneficial inferences from analysis of association between variables, using tools that measure explicit items and find answers to problem that the investigator seeks to solve. In quantitative inquiry, the researcher uses a deductive approach to test hypothesis(es), while controlling for other related causes and observing measures that will help avoid bias (Creswell & Creswell, 2017). In order to avoid these threats to validity, quantitative inquiry involves checks in the form of controls (Cypress, 2017).

The mediator of interest in my study is the respondents' SES group. This provides some guarantee that participants with the outcome are correctly identified. A prevalence study or assessment of the separate potential risk factors observed may not adequately explain relative risk or proportion of mental illnesses that resulted in the presence of

particular factors among people with mental disorder. It is easier to quantify risk due to specific potential causes using controlled epidemiological studies (Yada, 2017).

Instrument

The following tools were used to collect data in my study: 1) I used information from the family history - research diagnostic criteria: [FH-RDC] (Endicott, 1978) to measure the family level factors which have effects on the onset of mental illnesses in the participants. 2) The information from the Adverse Childhood Experience Questionnaire (ACE-Q) was included to elicit information on child abuse, dysfunctional family, childhood development, criminal behavior, divorce, domestic violence, drug abuse, early memories, family background, and home environment; 3) Information from the Cognitive Emotion Regulation Questionnaire (CERQ), a multidimensional questionnaire guided in identifying the cognitive emotion regulation strategies (or cognitive coping strategies), investigating the associations that exist between cognitive coping strategies, personality variables, psychopathology and other variables (Universiteit Leiden, 2015). The 18-item CERQ instrument was used to have a manageable, but measurable set of indicators that effectively assesses the individual respondent's pecuniary coping strategies. Clients' medical folders/records provided further information on medical diagnosis, relevant social, family-related information and other relevant sociodemographic factors.

Socioeconomic status was assessed using the modified Fahmy and El-Sherbini scale (El-Gilany et al., 2012). The Fahmy and El-Sherbini scale has been commonly used in mental health research (Nagy et al., 2015; Saleem and Saada, 2015; Salem, Allah, & Said, 2016). The scale assesses SES using seven broad domains: education & cultural,

occupation, family, family possessions, economic, home sanitation and health care (El-Gilany et al., 2012). The participants' SES was categorized into low, middle and high socioeconomic status. However, I focused my study on participants in the lower and middle socioeconomic levels, as studies had shown that both levels form the most prevalent socioeconomic groups in Nigeria (Olaniyi, 2013; Ovwigho, 2011).

Summary and Conclusions

The major themes discussed in this chapter include, upstream ACEs, their influence on more distal outcomes and on mental health disorders. Importance of personality factors like coping strategies, as well as history of mental illness in first degree relatives were equally enumerated to examine the extent of knowledge existing on interactions between these upstream risk factors and with mental health disorders.

Adverse childhood events have been found to contribute significantly to onset of mental disorder in all stages of life, including in childhood (McLaughlin, 2016), adolescent stage (Bielas et al., 2016; Mendonça & Ludermir, 2017) and in adult life (McLafferty et al., 2015; Nurius et al., 2015). The review of literature in this study corroborated the primacy of domains such as: trauma or abusive (Kelley et al, 2015), household dysfunction (Björkenstam et al., 2016; Clemens et al., 2019; Felitti et al., 2019, Gilbert et al., 2015), criminality in families (Finkelhor et al., 2015) and intimate partner violence or parental separation (Choi et al, 2017; Mendonça & Ludermir, 2017); in understanding the etiogenesis of mental health disorders. I examined all these domains in my dissertation.

Sometimes these ACEs exists alone (Björkenstam et al., 2017; Kerker et al, 2015), or in combination to produce a risk of mental disorder. Adverse childhood events can also co-exist to result in mental disorder. For example, childhood maltreatment has been found to co-exist with household dysfunction (Felitti et al., 2019), substance use disorders (Neger & Prinz, 2015), and emotional abuse and neglect (Lee, 2015).

Risk factors may also interact with ACEs to produce mental health disorders. Someshwar and colleagues demonstrated that when individuals are exposed to ACEs in early years, they are prone to developing mental health disorders, especially in the presence of a family history of mental health disorders and in female sex (Someshwar et al, 2019). Smearman et al., 2016 described in further details how child abuse and epigenetic mechanism influence mental health outcomes. In the presence of recent exposure to psychosocial stressors, individuals with history of ACEs are more prone to mental health disorders (Karatekin, 2018). Such outcomes have been associated with alcohol-related substance disorders (Fuller-Thomson, Roane, & Brennenstuhl, 2016). An examination of these associative risk factors is important resource for understanding the pathway to disease.

Pecuniary personality characteristics accounts for some of the difference that exist in human behaviors. Individual unique personality traits like their locus of control and coping strategies supports them in navigating the existential challenges of life (Compas et al., 2017). The literature review showed that these unique internal mechanisms can be cognitive (Botvinick & Braver, 2015), affective (Bault et al., 2017), and motivational or behavioral in nature (Compas et al., 2017). The presence of these systems in individuals,

help them to meet basic needs of life and equip them with strategies that protect them from interpersonal or physical harm (Kraaij & Garnefski, 2019). The individual, when functioning optimally, can adapt well to differing life situations and will be able to function in various roles, without the risk of being impeded by errors in thinking; can maintain a balance between emotional distress and realistic problems and his goals are facilitated, rather than impeded by occurrences (Kraaij & Garnefski, 2019). There are scant literature examining influence of co-existing risk factors that serve as pathways to mental health disorder

My review of literatures also exposed the fact that it was more difficult to ascertain true causal mechanisms by which family history leads to mental health disorders. However, an in-depth review showed strong epidemiological and clinical evidence that illnesses can be found in first degree relatives and families of individuals with mental health disorders (e.g., Cheng et al, 2018; Bijl et al., 2015). Such familial illnesses have been attributed to the role of gene methylation (e.g., Romens et al., 2015), familial clustering (e.g., Isomura et al., 2015), gene-environment interactions (e.g., Lopizzo et al., 2015), among others.

Socioeconomic disadvantage was identified as a major contributor to onset and outcome of mental health disorders. This study revealed the reasonable correlation between all SES indicators and mental health disorders. I found that factors such as unemployment (e.g., Laanani et al., 2015), culture (e.g., Kirmayer & Ryder, 2016), income (e.g., Ribeiro et al., 2017), and social circumstances (e.g., Adhvaryu, Fenske, & Nyshadham, 2019) predict outcomes in clients with mental health disorders. Few studies

like that by Agerbo et al (2015), investigated the influence of co-existing family history and socioeconomic risk factor on onset of mental health disorders. However, there are gaps in knowledge about how multiple risks combine to correlate with mental health disorders and comparison of different distal risk factors between schizophrenic and mood disorders. I attempt to answer this major question and extend knowledge about how multiple risk contribute to chronic disease etiology. This could be helpful material for research in disease epidemiology.

Chapter 3: Research Method

Mental illness has been associated with upstream risk factors ranging from family-related risk factors (Agerbo et al., 2015), to those that occur in early life (Nestler et al., 2016), adverse childhood experiences (Felitti et al., 2019), individual coping strategies (Botvinick & Braver, 2015), and socioeconomic factors (Shokouh et al., 2017). These studies highlight association between the risk factors and mental illness, though the authors rarely explore paths through which the variables interact together, especially in the context of mediation by socioeconomic factors. I used a theoretical lens to examine pathways that exist between upstream risk factors and how they are associated with mental health disorder. Attention was paid to elucidating the mediatory role of socioeconomic status on the disease outcome. The present chapter will address the following: the research design, together with a description of the sample, setting, and instruments. The study instruments include the family history - research diagnostic criteria (FH-RDC), adverse childhood experience questionnaire (ACE-Q), cognitive emotion regulation questionnaire (CERQ), and socioeconomic indicators from the district health survey. Finally, the data collection and analysis, as well as ethical considerations (which involves participant's protection) will be discussed.

The research questions here are different from the originally proposed – mainly because at the end, all my population were with mental disorders. I needed to change the comparison from "between case and controls" to between "schizophrenic cases and depressive cases.". The revised questions informed the data collection and results and is reflected from this chapter and beyond.

Research Questions and Hypotheses

RQ1: Is there statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives?

$H_0$1: There is no statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives.

H_a1: There is a statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives.

RQ2: Is there statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence on mental health outcome)?

$H_0$2: There is no statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence).

H_a2: There is a statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence).

RQ3: Is there statistically significant differences in coping strategies between patients with schizophrenia and patient with mood disorders?

$H_0$3: There is no statistically significant differences in coping strategies between patients with schizophrenia and patient with mood disorders.

H_a3: There is a statistically significant differences in coping strategies between patients with schizophrenia and patient with mood disorders.

RQ4: Do socioeconomic risk factors have a mediating effect on these relationships?

$H_0$4: Socioeconomic risk factors do not have a mediating effect on these relationships

H_a4: Socioeconomic risk factors have a mediating effect on these relationships

Research Design and Rationale

In this study, I examined the association between family history of mental illness in first degree relatives, adverse early experiences, and individual coping strategies on types of mental health disorders, while adjusting the mediatory role of socioeconomic status. In this study, the independent variables were family history of mental illness in first degree relatives, adverse early experiences, and coping strategies and dependent variable was type of mental health disorder. The confounder variable or mediator in this study as SES, which was measured based on the hypothesis that SES may have an effect on the relationship between the upstream factors being assessed and mental health disorders. I used a cross-sectional survey design, using binary logistic regression models to examine the interactions between each upstream risk factor and mental health disorders

in such a way that when SES was introduced as a moderating variable it is possible to estimate the association between this potential mediator and types of mental health disorders. The regression model was selected because it is the best form of analysis that can address the research questions. The statistical method is equally helpful in assessing whether the moderating variable affects the relation between the dependent and independent variable (Szklo & Nieto, 2014). The unique advantage with regression models is the ability to estimate associations between independent and dependent variables, while holding the all-other variables constant, hence it's a useful way to adjust for potential mediating variables (e.g., Szklo & Nieto, 2014). This made it possible to account for the mediating variable being tested in this study (which is socioeconomic factors).

The cross-sectional survey design ensures data is collected at a specific point in time, and allows the researcher to examine the research hypotheses, by focusing on the multiple exposure in the study (Creswell, 2017). This design equally allowed examination of the relationships between all classes of variables. Unlike in experimental design, the independent variable in this study was not be manipulated, but variables of interest were assessed using quantitative tools that have been used by other authors in earlier studies. Several similar studies have used the cross-sectional survey techniques. For instance, Alpak et al. (2015) used the survey technique to examine associations between comorbid medical disorders and family history in first degree relatives of probands. with bipolar mood disorder. The author applied the FH-RDC questionnaire, also being used in this study, on a cross-sectional sample of patients with bipolar

disorders. Others like Hu et al. (2017) investigated the role of cognitive emotional regulation strategies in people that are unemployed.

The instruments used in this study includes: the FH-RDC questionnaire (Endicott, 1978), ACE-Q questionnaire (Anda, 2007), CERQ questionnaire (Ireland et al., 2017), and socioeconomic indicators from the modified Fahmy and El-Sherbini Scale (El-Gilany et al., 2012). I will describe these in more details in the further discussion.

Methodology

Population

The location of this study was new Karu, the headquarters of Karu local government area of Nassarawa state. Nassarawa state is situated in the north-central region of Nigeria. It has 13 local government areas and is in close proximity to Abuja (the administrative capital of Nigeria). Karu General Hospital is a secondary health institution located in new Karu LGA. This is a 135-bed capacity hospital that serves as a referral facility that receives clients from all other primary and secondary facilities in Abuja and several neighboring states (Vanguard media limited, 2017). The Karu General Hospital is a secondary health care institution that has gone through several stages from the initial 225-bed hospital, 40% of the hospital was leased to a private firm (Vanguard media limited, 2017).

The town where the hospital is located has a diverse population. The medical records show that several of cultural groups residing in new Karu council and in the environs receive treatment in the hospital. The common ethnic groups in the area include: Yeskwa, Gade, Koro, Gbagyi, Igbo, Hausa-Fulani, Tive, Yoruba, Eggon, and Mada.

The Karu General Hospital is managed by the Health and Human Services Secretariat of the Federal Capital Territory and has about three clinical specialist departments, including antenatal, general outpatient, and psychiatry departments. My study population was the psychiatric department of the Karu General Hospital. The population included the number of patients who have been treated or are still undergoing treatment at Karu General Hospital, new Karu. The implication is that a convenience sample of people who visit the psychiatric department of the hospital during the period of my data collection were selected for the study.

Sampling and Sampling Procedure

The sample for my study was drawn from a convenience sample of clients receiving services at the mental health department of the Karu General Hospital, a secondary health institution located in Nassarawa state. Participants of all ages who received psychiatric services from either the outpatient psychiatric clinic or on admission at the time of the study, and who met criteria for selection of participants, were recruited.

The COVID-19 pandemic and restriction in movement affected clinic attendance in the period when data collection for this study took place. This significantly impacted my ability to recruit a control group of noncases without mental disorders from the outpatient unit of the study site. This constraint led to a decision to compare the schizophrenic group and mood disorders groups, to see if there are differences in these two groups. The research questions and hypotheses have been reviewed to reflect this adjustment. Therefore, the research questions are different from the original ones in

earlier chapters. Also, the study results examined the difference in risks between these groups of disorders.

To determine the appropriate sample size for this study, I used the G*Power 3.1 software . The sample size was estimated using a power of .8 and alpha level of .05, which are considered as standard measures in psychological research and appropriate values to establish adequate statistical power (see Byrne et al., 2014). Since there was limited research on interaction between upstream risk factors and types of mental health disorders, as well as a limited number of possible participants, both medium and large effect sizes (f^2) of .25 and .47 respectively were used for the regression calculations. The smallest essential sample size calculated using a large effect size was 41. With a medium effect size, a conservation number of 101 participants was obtained. When a 10% nonresponse rate is added to the average sample size, the total sample size that was sought for this study comes to approximately 110. However, in the process of data collection, 118 clients opted to participate and were enumerated in the study.

Study participants were selected using the convenience sampling technique, a nonprobability sampling technique, also known as “haphazard or accidental sampling” (e.g., Etikan, Musa & Alkassim, 2016; p.2.). Nonprobability sampling is used in situations where population is not well defined, or they are at the right place when needed (Etikan et al., 2016). Convenience sampling has been the most used collection method in clinical research, where only patients that meet the inclusion criteria are selected (Etikan et al., 2015). The applicability of this technique to clinical research is because an investigator is able to enroll subject based on their accessibility and availability (Elfil &

Negida, 2017). I included accessible populations of clients with mental health disorders in the psychiatric department of Karu general hospital within the study period that meet the eligibility criteria in this study.

The inclusion criteria for the study consists of the following (a) participants diagnosed for illnesses within the two major DSM-IV categories, psychotic and anxiety disorder; (b) participants belonging to the lower and middle socioeconomic groups; and (c) participants who are able to personally respond to survey question and has a first degree relative to answer family history questions. Participants who do not meet these criteria were excluded from this study.

The advantages of the convenience sampling technique include its ease of use; as well as the fact that technique is quick, inexpensive; and unlike in random sampling, does not require a list of all the population elements (Etikan et al., 2015). The major drawback to convenience sampling is that, compared to probability sampling techniques, results may not be generalizable to populations outside of the sample (Etikan et al., 2015). Another challenge with convenience sampling technique is the likelihood of participants self-selecting into the sample, hence introducing bias and possibility of outliers (Etikan et al., 2016). Unfortunately, the convenience sampling technique does not take care of biases and their probability of occurrence (Etikan et al., 2015).

Authors have used the convenience sampling technique to examine the relationships between ACEs and homelessness (e.g., Middleton et al., 2018), substance use disorder (e.g., Kiburi et al., 2018), and psychotic illnesses (e.g., Mongan et al., 2019). Middleton et al. (2018) examined a convenience sample of 131 homeless youths that had

been exposed to sex abuse (trafficking) in childhood. The study found that many the sampled homeless youths were victims of sexual abuse and were more likely to report history of previous suicide attempts, self-harm behavior, and substance use (Middleton et al., 2018). Since convenience samples may not be generalizable, the authors concluded that participants in their study may not be representative of all people experiencing homelessness (Middleton et al., 2018).

Procedure

A cross-section of participants was recruited from the psychiatry department of the Karu general hospital, using a convenience sampling technique. The participants included all clients who walk into the hospital to receive psychiatric services at the outpatient clinic or are on admission and gave a consent to participate in the study. Like Cambridge University Press (2018) suggested, recruitment for a cross-sectional study is usually less difficult compared to that for randomized controlled trials and cohort studies, as only one-off data collection is needed and requires no further obligation to follow-up.

I strictly adhered to ethical principles, allowing potential clients to decline to participate in the study and have adjusted the required sample size to reflect the refusal rate. I explained the research procedures, expectations, and risks to each participant as a part of the process of obtaining an informed consent, explaining to them that they could decline participation or discontinue at any point in the research. I equally emphasized that there was no penalty for exercising their right to decline. Every client who walked up to me was given an information packet that included copies of implied consent, as well as definitions of the terms used in the study. The consent form highlighted issues around

confidentiality, and protection of participants' identity. All participants were allowed decide whether to participate in the study.

First, I asked the patients to complete the short biodata form which contained information of the participant's name, age sex, educational background, ethnicity, and occupational status. Then, the participants completed the Fahmy and El Sherbini questionnaire which measures the socioeconomic characteristics of the study participants. Participants who are from upper socioeconomic class were thanked for their participation and excluded from the study at this time. The participants from the middle and lower socioeconomic group (the target group for this study) were required to complete the main research questionnaire that included combined indicators from the ACE-Q questionnaire, CERQ questionnaire, and FH-RDC questionnaire. Questions related to the participant childhood experiences, coping strategies and family history were assessed at this point.

Adequate attention was paid to time management, so I asked structured questions in the language which the clients understood. Where necessary, I requested the services of a translator for clients who can speak in the most common languages, aside English language (which I speak well). To limit bias following the recruitment of my translator, the translator was trained to use of the research tool, ensuring that a proper understanding of each item on the tool. This happened prior to commencement of my study and helped minimize bias that could have arisen from the wrong translation.

Participants who had completed the questionnaire were debriefed on the general description of the study, while I addressed any concerns and provided information on

how to receive results when the analysis is complete. All this information were also included in the information packet given to the participants at the beginning of the study.

Instrumentation and Operationalization of Constructs

The measures used in this study included the Fahmy and El-Sherbini scale and a main research questionnaire. The main research questionnaire assessed the participants' biodata and contained items from each of the following questionnaires: the CERQ, ACE-), and the Family History – Research and Diagnostic Criteria. All participants who consent to the study were given the first instrument (the questionnaire containing the Fahmy and El-Sherbini scale) to determine the socioeconomic group to which they belong; only those in the lower and middle socioeconomic groups were enumerated. After the Fahmy and El-Sherbini Scale Questionnaire identifies those in the two groups of interest, the main research questionnaire was then administered.

Participants' medical folders/records provided further information on relevant social, family related, and other relevant sociodemographic factors. After all indicators are collected, I then examined how socioeconomic status moderates the risk of exposure to upstream factors in predicting the mental health outcome in the study.

Cognitive Emotional Regulation Questionnaire

CERQ is a multidimensional questionnaire that was used to identify the coping strategies of participants in this study. The CERQ is helpful for investigating relationships specific cognitive coping strategies, personality variables, psychopathology and other problems (Universiteit Leiden, 2015). I sought and received approval from instrument author to use the tool for this study.

Up till about a decade ago, there were no instruments existing to measure cognitive components of emotional regulation (Garnefski et al., 2001). The CERQ was developed to address this gap (Garnefski et al., 2001; Yeung, Lu, Wong, & Huynh, 2016). Unlike most other tools that are used in assessing coping strategies, the CERQ differentiates between an individual's thoughts and concrete actions, especially highlighting these thoughts as a follow on to a negative event (Universiteit Leiden, n.d.). The CERQ can be self-administered, but for the purpose of this study the interviewer administered to ensure completeness and ease of use. The interview approach was also more suitable, as it allowed me to probe to ensure the responses do not fall short of what is required, and also because the participants had different levels of reading ability and a few had difficulty understanding the questions.

The CERQ can be administered in research involving both general or clinical populations (Universiteit Leiden, n.d.). The tool is used to assess both the general cognitive coping style, as well as cognitive strategies after a negative experience or event. There are separate versions of the tool for adults, adolescents and kids. An 18-item version was also developed which can be used for both diagnostic or research purposes (Universiteit Leiden, n.d.). I used this short version in order to avoid excessive participant burden. When the research instrument is too bulky, there was also the likelihood that the investigator is burdened, hence contributing to poor recruitment.

Based on empirical and theoretical observations, the CERQ focused on nine distinct cognitive emotion regulation strategies. Each strategy refers to what an individual may contemplate following the experience of threatening or stressful events (Universiteit

Leiden, n.d.). The CERQ has nine distinct subscales, each consisting of four items and each referring to what someone thinks after the experience of threatening or stressful life events: self-blame, other blame, rumination, catastrophizing, putting into perspective, positive refocusing, positive reappraisal, acceptance, and planning (Universiteit Leiden, n.d.).

A 5-point Likert scale was used to measure the cognitive emotional regulation strategies, ranging from: 1 (almost never) to 5 (almost always). The subscale scores are obtained by adding the scores for that particular subscale (ranging from 4 to 20). Evidence from literature have shown that all subscales have good internal consistency, often ranging from .68 to .86 (Yeunget al., 2016) Individual subscale scores were obtained by summing the scores belonging to the particular subscale (ranging from 4 to 20).

Researchers have used the CERQ to examine the influence of coping strategies on mental health outcomes (Brugginket al., 2016; Langer et al., 2017). Ioannidis and Siegling (2015) analyzed the criterion and incremental validity of the CERQ by examining the relationship between "CERQ subscales with emotion-laden and cognitive criteria, as well as their incremental validity in predicting these criteria over the Big Five personality factors" (p 15). The criteria the authors used included relevant variables drawn from constructs which have been investigated previously as a criterion of the CERQ and those that need a replication for their known relationship with the CERQ (Ioannidis & Siegling, 2015). The authors also examined the relationship between emotional regulation strategies and mindful coping, otherwise known as coping skills,

that are based on mindfulness qualities (Ioannidis & Siegling, 2015). Bivariate correlation coefficients for the emotion regulation questions (ERQ), emotion-laden and cognitive criteria showed the two ERQ subscales were largely independent, with weak positive correlation (Ioannidis & Siegling, 2015). The cognitive regulation had a weak negative correlation with neuroticism; and moderate correlation with conscientiousness and agreeableness (Ioannidis & Siegling, 2015).

Universiteit Leiden (n.d) described the process of assessing internal consistency of the nine CERQ scales using alpha coefficients in all research populations. The alpha coefficients of the subscales in the diverse populations were up to .70 to.80. Self-blame in late adolescence had the lowest score of .68 and other-blame a score of .68 in early adolescents (Universiteit Leiden, n.d). According to Universiteit Leiden (n.d), these lower scores are acceptable when the number of items in each scale is put into consideration.

Adverse Childhood Experience Questionnaire

The ACE-Q provided information on an history of the following: child abuse, dysfunctional family, childhood development, criminal behavior, divorce, domestic violence, drug abuse, early memories, family background, and home environment. The ACE-Q is a 10-item questionnaire developed in 1988 by Felliti and colleagues (Felitti, et, al 2019) (see appendix). The tool was used to examine the association between adverse upbringing context and childhood maltreatment that has effect on adult outcomes (Zarse et al., 2019). The tool is freely available online and requires no special authorship permission.

The ACE-Q was developed by physicians working at Kaiser Permanente using several earlier researched tools (Zarse et al., 2019). The ACE-Q examines the subject's recall of exposure to psychological, physical, and sexual abuse as well as household dysfunction including domestic violence, substance use, and incarceration before the age of 19 years (Zarse et al., 2019). The ACE-Q study at Kaiser Permanente as it was called, involved 13,498 patients who responded to a survey assessing their current medical symptoms and past adverse experience (Zarse et al., 2019). The findings from the ACE-Q study sample provided information from which the ACE-Q was published (Felitti, 1998).

Zarse et al. (2019) demonstrated the association between increasing ACE scores and larger degrees of adult illness burden. This relationship is predicted more often by the increase in number of types of ACEs to which an individual is exposed, rather than the severity of any single type of adverse event (Zarse et al., 2019). This relationship is the core strength of the ACE-Q and may also be its defining weakness. The ACE-Q is a rapid tool for assessing the degree of convergence of the different ACEs and contexts in an individual (Zarse et al., 2019). However, according to Zarse et al. (2019), the tool does not measure duration, timing, quality and severity of individual ACE scores. However, this did not affect outputs from this study, as none of the variables are essential, nor components of the study objective.

The greatest advantage of the ACE-Q over other tools for measuring ACEs, is its unique productivity when exposing any dose-response relationship in which convergence of different ACEs result in poor health outcomes in later life (Felitti, 1998; Hughes et al., 2016). Over the years the ACE-Q has been used to assess varied forms of populations

across the world (Matsuura, Hashimoto, & Toichi, 2009; Ramiro, Madrid, & Brown, 2010), and validation studies show that scoring of the ACE-Q continues to be strong as a predictive measure, in spite of potential that may result due to self-reporting memory items (Dube, et al., 2004; Hardt, Vellaisamy, & Schoon, 2010).

Family History - Research Diagnostic Criteria: [FH-RDC]

The Family History – Research and Diagnostic Criteria (FH-RDC) provided information to measure the family level factors which have effects on the onset of mental illnesses (see appendix). The FH-RDC was developed to allow investigation to access or diagnose mental health disorders in relatives of index subjects, especially when it is not possible to have direct access to the relatives (Endicott, 1978). I requested and received permission to use the FH-RDC questionnaire from author of the publication.

According to Endicott (1978), the items on the FH-RDC are constructed to be as close as possible to the directly administered Research Diagnostic Criteria, which are used when directly assessing the subjects. The difference between the two instruments is that the FH-RDC has been designed to address the usual challenge of incomplete information, which arises when collecting data about another person's psychiatric disturbance from another person (Endicott, 1978). Evidence from studies that have also assessed the differences between the FH-DC and family history method has revealed that there is usually a higher chance of obtaining false negative, than false positive results, when the FH-RDC is used (Cuijpers & Smit, 2001; Hudsonet al., 1983; Zimmermanet al., 1988). The difference between the family history method and the family study method is that the former obtains information from the patient or a relative about all other family

members, while the latter involves direct interview of as many relatives as possible to assess their symptomatology (Andreasenet al., 1977). Using the family history method raises concerns about challenges with under-reporting by relatives. However, Andreasen et al. (1977) stated that by developing the 12-item diagnostic criteria, this challenge is significantly minimized.

The FH-RDC has been found to be a reliable and valid measure for assessing the association between family history and alcohol use disorder (Andreasen et al., 1977; as cited in Chavarria, Rueger, & King, 2018) and schizophrenic disorders (Ho, Barry, & Koeppel, 2018). Just like these two sets of authors, Sorocco and colleagues found a high degree of inter-rater reliability (.95) for reports of substances use disorders (Soroccoet al., 2015).

Sorocco et al, (2015) reported a positive family history when either biological parents met criteria for alcohol or substance use using subject reports, negative history where no alcohol or substance use disorders occurred in biological parents or grandparents. The authors found that in 89% of cases, there was a correlation between the subject reports and responses obtained from parent interviews (Sorocco et al., 2015).

Modified Fahmy and El-Sherbini Scale

SES was assessed using the modified Fahmy and El-Sherbini Scale (El-Gilany et al., 2012). The modified Fahmy and El-Sherbini scale has been used extensively in mental health research (Saleem and Saada, 2015; Salem, Allah, & Said, 2016; Nagy et al., 2015). Over the decades, social researchers have devised a number of tools and scales for measuring SES in different countries and under varying settings. Each of these tools

have their unique strengths and weaknesses, and there is no single one that can be adapted to all sociocultural settings around the world (El-Gilany et al., 2012). However, there is general agreement about a number of key variables essential in determining SES of an individual, including income, education and occupation (Gupta and Ghai, 2007; as cited in El-Gilany et al., 2012) (see sample items in appendix).

The modified Fahmy and El-Sherbini scale addresses some of challenges with tradition scales for assessing SES. For instance, people may be reluctant to respond to questions assessing income in monetary terms (e.g., monthly income *per capita*), because they may not be willing to talk about their income; hence it's often problematic to assess (El-Gilany et al., 2012). The modified Fahmy and El-Sherbini scale includes measures of income in more than one domain, like assessment of ownership of agricultural and non-agricultural land for housing, family possession, ownership of other houses, among others (El-Gilany et al., 2012). These factors all contribute to family income. The North-central region of Nigeria, where this study was conducted, has almost similar characteristics as Egypt; as the whole family, including men, women, and children may be working (e.g., Igbolo & Adaka, 2017). Similarly, child labor exists in such semi-urban communities like Gwagwalada, where the study site is located (Makwe & Ahmad, 2017). Putting these issues into consideration, the modified Fahmy and El-Sherbini scale uses the number of members earning an income in family, irrespective of the occupation type or season (El-Gilany et al., 2012). Studies have shown that education is correlated with income (Braveman et al, 2005; Noble et al., 2015), but these correlations are not strong enough to justify its use as proxy for income or otherwise (Braveman et al, 2005). Braveman et al.

(2005) pointed out the fact that income can vary widely among people of similar educational level, especially across dissimilar social groups.

The modified Fahmy and El-Sherbini scale is a slight revision over the original scale of Fahmy and El-Sherbini, which was the most commonly used scale for measuring SES in Egypt (Fahmy & El-Sherbini, 1983). There are slight agreements between the old and modified Fahmy and El-Sherbini scale, explained by the difference in cut-off points in each scale (El-Gilany et al., 2012). According to El-Gilany et al. (2012), while the old scale used arbitrary cut-off points, the modified scale is based on statistical estimates (1^{st}, 2^{nd} and 3^{rd} quartiles). Evidence from the modified scale showed an increase in percentage of people within the higher socioeconomic levels, which may be related to improvements in opportunities from higher educational attainment in a country like Egypt. Just like Egypt, higher education and improvements in entrepreneurial training has contributed largely to better living conditions in Nigeria (Ogundele, Akingbade, & Akinlabi, 2012).

Salem, Allah, and Said (2016) examined the prevalence and associated risk factors of depressive illness, anxiety and stress among students in an Egyptian University. Prevalence of the disorders were assessed using Arabic short version of the standardized Depression Anxiety Stress Scale-21 items (DASS21), and the risk factors through a structured questionnaire (Salem, Allah, & Said, 2016). Salem and colleagues found that 26.3% of the students belonged to low, 43.0% to moderate and 30.7% to the high socioeconomic classes respectively (Salem, Allah, & Said, 2016). There was a statistically significant association between depression and stress with social class (p=0.00) (Salem, Allah, & Said, 2016).

The modified Fahmy and El-Sherbini scale has been found useful in examining association of SES with definite outcomes, hence its applicability to my study (e.g., El-Gilany et al., 2012). The new scale classifies SES into very low, low, middle and high levels; based on the quartiles of the calculated score instead of a fixed point (El-Gilany et al., 2012). It is therefore applicable in different sociocultural settings and populations with diverse socioeconomic circumstances (El-Gilany et al., 2012). Socioeconomic status is classified into high SES with score of 25–30, middle SES with score of 20–<25, low SES score of 15–<20 and a score of <15 is rated as very low social status (Saleh et al, 2013).

Data Analysis

Data was entered into SPSS 25.0 software, following a visual analysis to ascertain validity by searching for outliers. Where outliers exist, I modified by windsorizing; a process in which the outlier in a dataset is made one unit larger or smaller than the most extreme score. This is done by finding the value whose standard score is closest to the absolute value 3.29, then adding one to that value (the resulting value is then used to replace all outliers for the variable; Morrow, n.d).

Demographic data was presented in a table which included descriptions of the study sample. Graphic representations of each of the independent variables was done using frequency distribution tables. I provide visual illustrations that depict important indicators under each of the domains that are obtained from measures of the independent variables.

To assess the ACE scores, I made available graphical illustration of ACE scores of participants. The ACE-Q questionnaire was used to assess ACEs on a 10-item scale, including childhood abuse (emotional, sexual and physical abuse, as well as physical and emotional neglect), household dysfunction (separation and divorce, domestic violence, substance abuse, mental illnesses in family and incarceration of family members). I relied on a scoring by Merrick, et al. (2017) in which a dichotomous scale of either yes (1) or no (0) was used to score the 10 items and response for each item and cumulative score analysed. Graphical depictions and frequency distribution tables of the ACE scores or the respondents has been included in chapter 4.

An assessment of the statistically significant differences in coping strategies between patients with schizophrenia and patient with mood disorders was done with a one-way Multivariate Analysis of Variance (MANOVA), by computing on all variables. Univariate differences in mental health disorders were assessed based on the CERQ subscales, namely: self-blame, acceptance, ruminations, positive refocusing, refocusing on planning, positive reappraising, putting in perspective, catastrophizing, and other blame strategies. The means, standard deviations, alpha coefficients and univariate Fs was assessed in relation to the dependent variable. According to Garnefski, Kraaij, Spinhoven (2002), the more an individual uses a cognitive strategy, the higher will be the score on the specific subscale.

The FH-RDC questionnaire was used to collect information on nature of psychiatric disorders in first degree relatives. The between-group differences was assessed based on socioeconomic group of the respondent was tested using the Pearson

chi-square. However, due to the possibility of multiple comparisons, I used the Bonferroni correction. The results that were statistically significant were associated with a *P*-value _ of .05, although *P* values that are nonsignificant were also reported.

The modified Fahmy and El-Sherbini Scale was used to assess the socioeconomic status of the respondents. The scale is made up of 7 domains with a total score of 84 (Fahmyet al., 2015). Socioeconomic level was measured on the scale and classified into very low, low, middle and high levels depending on the quartiles of the score calculated (seeFahmy et al., 2015).

A logistic regression analysis was conducted to determine whether there was a statistically significant difference in the way the set of independent variables (namely the family history of mental illness in first degree relatives, early adverse experiences, individual cognitive coping strategies) influenced the types of mental health disorders. I also explored whether socioeconomic risk factors had a mediating effect on these relationships.

Threat to Validity

External threats to validity may have occurred in this study as a result of the non-sampling technique which was used. Participants were selected from the psychiatric department using a convenience sampling procedure, because this was the most convenient way to have access. This means that not all population members had an equal chance of being selected. However, recruitment of participants was open to all clients who desired to participate in the study and met the inclusion criteria. The sample used in this study may not be representative of all population of clients receiving services in the

mental health department. Although the convenience sampling used in this study does not promote eternal validity, I paid close attention to ensuring sufficient sample is taken, so as to have a representative proportion of the total population of clients receiving services in Karu general hospital. The result and conclusion from this study may reflect the limitation above, noting the extent to which they can be applied to clients in other/a different mental health institution.

The biodata of all individuals was assessed using the biodata aspect of the main questionnaire, with the hope of having individuals from different cultures, ages, ethnic group, gender, educational and occupational groups participate in this study. This helped to address threat to validity in this area. In order to address another threat to external validity, I presented instructions to all participants in such a way that the same information was conveyed to everyone participating in the study. There was also the threat to external validity that arose from participants self-selecting or dropping out, because of influence from other participants in the study.

Internal threat to validity may arise from the length of the questions on the questionnaires, leading to some of the participants opting out of the study. To address this and where applicable, I have used indicators/instruments with limited questions but which have undergone significant reliability and validity tests. I also considered making light snacks available to the participants, as a show of gratitude and I was available at all times to explain all aspects of survey. This way, internal threat to validity was assured, as participants were less prone to getting tired, thus rushing through the test, in order to end the study.

Another threat to internal validity is related to poor recall when participants are required to provide histories, as seen with use of the FH-RDC or ACE-Q questionnaire, which requires recollection of history of mental health disorders in first degree relatives or past events of abuse. There is a chance that individuals may not have accurate information, due to length of time since event occurred and the possibility that other events may have happened in the individual's life that can obscure such events.

Ethical Procedures

I presented a proposal describing the study objectives, plans and output to the ethics review boards of the Federal Capital Territory Authority, before the study was conducted and ahead of the Walden Institutional Review Board (IRB) approval. On receipt of approval from the ethics board, I submitted a request for IRB approval which was granted. I then contacted the psychiatric department of Karu general hospital to request permission to carry out the study. I provided the option for participants to opt out of study, after receiving implied consent forms which indicated anonymity and confidentiality related issues with participation.

After completing the questionnaires, participants were debriefed. This debriefs process included a general description of the study, addressed all participant concerns, and provided an opportunity to receive the results of the study, when completed. The participants were fully informed about the nature of study and no form of deception was used. Participants were requested to sign a consent form which specifies issues around confidentiality and anonymity and were informed about their rights to withdraw from study at any point they wish to stop participation. Furthermore, the consent form included

my contact, so that participants can reach me, in case they required additional information on their rights as it related to the study. No personal identifiers were included in the data collection. In line with guideline from Walden University Office of Research Integrity and Compliance, data collected isto be stored on a protected disk for five years before it is deleted.

Summary

This chapter outlined the research design and reason for using the design, population being investigated, type of sampling, procedure and measures, as well as threats to validity. Chapter 4 will highlight findings from the study and Chapter 5 discussion, conclusions, and further recommendations for future studies.

Chapter 4: Results

The purpose of this study was to identify pathways to schizophrenic and mood mental disorders by linking important responsible events like family history of mental illness in first degree relatives, early adverse experiences, and individual cognitive coping strategies, as measured by the FH-RDC (Endicott, 1978), ACEQ (Zarse et al., 2019), and CERQ (Universiteit Leiden, 2015), respectively. I also measured the moderating effect of socioeconomic status of respondents using the modified Fahmy and El-Sherbini Scale (El-Gilany et al., 2012). I had initially hypothesized that there would be a significant relationship between upstream family history of mental illness in first degree relatives and the occurrence of schizophrenic or mood mental health disorders. My second and third hypotheses were that there are statistically significant associations between the occurrence of schizophrenic or mood mental health disorders and upstream adverse childhood experiences in first degree relatives, as well as with upstream individual coping strategies. The fourth hypothesis differed slightly, as I postulated that socioeconomic risk factors have a moderating effect on all these relationships.

Participants responded to the survey items via an interview, using a structured tool that addresses the research questions and hypotheses. The study was proposed to identify how these items address the research questions, and statistical analyses were conducted using the 25.0 version of SPSS. I examined all relations between the variables, using an alpha level that is less than or equal to .05. During the logistic regression analysis for the fourth hypothesis, socioeconomic status was entered as an additional independent variable, to determine its mediating effects on the other independent

variables. This chapter highlights the participants' demographic information, as well as results from the data analysis which addressed the four hypotheses.

Results

A total of 145 clients consented to participate in the research study. Out of this population which consented for the study, 118 (81.4%) met the inclusion criteria for the study, 20 (13.8%) were excluded because they did not meet the eligibility criteria, while seven (4.8%) provided incomplete information and were excluded from the analyses. All participants in this study answered the demographic questions. The mean age of the participants in this study was 35.5years, with 94.9% in adulthood and 0.8% in childhood age ranges. Both male (53.4%) and female (46.6%) genders were sampled in the study, with the most frequently endorsed marital status being single (55.1%) and married (37.3%). Most of the participants were either from the Igbo (33.1%) or Yoruba (21.2%) ethnic groups and identified with the Christian religion (84.7%). The information provided by the participants who were eligible for the study, showed that majority belonged to either the low (55.6%) or middle (41.9%) socioeconomic groups. The participants' clinical record showed that majority were diagnosed with mood disorders (59.3%).

The demographic information of the participants who were eligible for the study is highlighted in the table below (see Table 1).

Table 1

Frequency Distribution and Mean of Sociodemographic Variables of Participants

Sociodemographic variables	*N*	Percent (%)

Age* (*N* = 118)		
• Early adolescents (12 – 15 years)	1	.8%
• Late adolescents (16 – 18 years)	3	2.5%
• Adults (18 – 65 years)	112	94.9%
• Elderly (≥ 66 years)	2	1.7%
Gender (*N* = 118)		
• Female	55	46.6%
• Male	63	53.4%
Marital status (*N* = 118		
• Single	65	55.1%
• Married	44	37.3%
• Separated	5	4.2%
• Divorced	2	1.7%
• Widowed	2	1.7%
Ethnicity (*N* = 118)		
• Yoruba	25	21.2%
• Hausa	11	9.3%
• Igbo	39	33.1%
• Others	43	36.4%
Religion (*N* = 118)		
• Christianity	100	84.7%
• Islam	18	15.3%
• Others	0	0.0%
Socioeconomic status (*N* = 117)		
• Medium SES	49	41.9%
• Low SES	65	55.6%
• Very Low SES	3	2.5%
Clinical status (*N* = 118)		
• Schizophrenic disorders	48	40.7%
• Mood disorders	70	59.3%
Nature of interview respondent's relationship with client		
• Father	2	1.7%
• Mother	5	4.2%
• Husband	2	1.7%
• Wife	1	.8%
• Self	101	85.6%
• Stepmother	2	1.7%
• Child	4	3.4%

• Sibling	1	.8%

*Mean=35.5; Standard Deviation=.28

I also assessed the participants' exposure to any incidences of adverse childhood experiences, by providing "yes" or "no" answers to questions on the ACEDQ (Zarse et al., 2019). Table 2 shows the frequencies of the adverse childhood experiences reported by the participants. Out of the 62 participants that reported having an adverse childhood experience, the most frequently reported number of ACEs was one (n = 24). The least group (n = 1) in the sample reported ten adverse childhood experiences.

Table 2

Number of Adverse Childhood Experiences Reported by Sample (N = 118)

Number of adverse childhood experiences reported	*n*	*%*
0	56	47.5%
1	24	20.3%
2	17	14.4%
3	11	7.3%
4	5	4.2%
5	2	1.7%
6	2	1.7%
10	1	.8%

The reported demographics of first-degree family members of participants was also assessed in this study. The respondents endorsed the fact that most of the living fathers and mothers had mean ages of 64.9 and 58.7 years respectively, representing 56.7% and 66.3% of the participants' parents. Majority (57.2%) of the fathers and 47.1% of mothers who had passed away belonged to the elderly and middle-aged groups. The first siblings with history of mental illnesses were mostly (66.6%) in the adult age range, with mean age of 34.8 years.

The participants reported only low percentages (0.8% and 2.5% respectively) of the fathers and mothers were hospitalized for psychiatric reasons, while their mean ages at first onset of psychiatric illness were 45 and 9 years, respectively. Similarly, 16.7% of

the first siblings had either period of social incapacitation or hospitalization for psychiatric reasons. Just one each of the fathers, mothers, and first siblings (representing 0.9%, 0.8% and 16.7%, respectively) had more than two hospital admissions. Limited respondents reported that the participants' mothers and first siblings (0.8% and 16.7 %) had somatic or psychological treatments for their psychiatric illness.

The study participants reported several psychiatric illnesses among their first-degree relatives. Depression was reported frequently among all the first-degree relatives of participants in the study. Some of the participants' fathers, mothers, and first-degree relatives (0.9%, 0.8% and 33.3%, respectively) were reported to have experienced depressive symptoms. Other common psychiatric illnesses reported included: alcoholism (2.6% and 33.3% of fathers and first siblings y), substance use disorder (1.7% and 50% of the fathers and first siblings) and unspecified functional psychosis (0.9%and 0.8% of fathers and mothers r). Only mothers were reported to have experienced chronic schizophrenic and schizoaffective disorders (1.7% and 0.9%).

The frequency distribution of family history and type of mental disorders in first degree relatives are highlighted in Table 3.

Table 3

Family History and Type of Mental Disorders in First Degree Relatives

Variables	Father			Mother			First Sibling		
	n	*%*	*Mean*	*n*	*%*	*Mean*	*n*	*%*	Mean
Age of living first degree relative			64.9			58.7			34.8
• Childhood	0	0.0%		0	0.0%		1	50.0 %	
• Adulthood	0	0.0%		9	10.8 %		0	0.0%	
• Middle age	38	56.7%		55	66.3 %		1	50.0 %	
• Elderly	29	43.3%		19	22.9 %		0	0.0%	
Age of dead first degree relative at death			28.2			62.6			22.0
• Childhood	0	0.0%		0	0.0%		1	16.7 %	
• Adulthood	8	16.3%		6	17.6 %		4	66.6 %	
• Middle age	13	26.5%		16	47.1 %		1	16.7 %	
• Elderly	28	57.2%		12	35.3 %		0	0.0%	
Period of social incapacitation									
• Yes	0	0.0%		0.0	0.0%		1	16.7 %	
• No	0	0.0%		0.0	0.0%		5	83.3 %	
Hospitalized for psychiatric reason									
• Yes	1	.8%		3	2.5%		1	16.7 %	
• No	116	99.2%		115	97.5 %		5	83.3 %	
Number of psychiatric hospitalizations									
• None	116	99.1%		117	99.2 %		5	83.3 %	
1	0	0.0%		0	0.0%		0	0.0%	
>2	1	.9%		1	.8%		1	16.7 %	
Somatic treatment for psychiatric illness									
• Yes	0	0.0%		1	.8%		1	16.7 %	

• No	117	100.0%	117	99.2%	5	83.3%	
Psychological treatment for psychiatric reason							
• Yes	0	0.0%	3	2.5%	1	16.7%	
• No	117	100.0%	115	97.5%	5	83.3%	
Age at first onset of psychiatric illness					45		9
• Childhood	0	0.0%	0	0.0%	2	66.7%	
• Adulthood	0	0.0%	2	50.0%	1	33.3%	
• Middle Age	0	0.0%	2	50.0%	0	0.0%	
• Elderly	0	0.0%	0	0.0%	0	0.0%	
Chronic schizophrenia							
• Yes	0	0.0%	2	1.7%	0.0	0.0%	0.0
• No	0	0.0%	116	98.3%	0.0	0.0%	
Schizoaffective disorder, Mania							
• Yes	0	0.0%	1	.9%	0	0.0%	
• No	0	0.0%	117	99.1%	0	0.0%	
Depression							
• Yes	1	.9%	1	.8%	2	33.3%	
• No	116	99.1%	117	99.2%	4	66.7%	
Unspecified functional psychosis							
• Yes	1	.9%	1	.8%	0	0.0%	

• No	116	99.1%	117	99.2%	0	0.0%
Alcoholism						
• Yes	3	2.6%	0	0.0%	2	33.3%
• No	113	97.4%	0	0.0%	4	66.7%
Substance use disorder						
• Yes	2	1.7%	0	0.0%	3	50.0%
• No	114	98.3%	0	0.0%	3	50.0%

Research Question 1 (RQ1)

RQ1. Is there statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives?

$H_0$1: There is no statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives.

H_a1:There is a statistically significant difference in the way schizophrenic or mood disorders are influenced by a history of mental disorder in first degree relatives.

A univariate two-way contingency analysis was conducted to examine the relationship between the clinical diagnosis in the participants and the independent

variables, including age of onset of the mental illness in both living and dead first degree relatives, as well as type of mental health disorders in the first degree relatives of the participants (inclusive of chronic schizophrenic and schizoaffective disorders, depression, unspecified functional psychosis, alcoholism and substance use disorders). There is no statistically significant difference in the way participants' family history of mental health disorders influenced either schizophrenic or mood disorders (Table 4).

The study findings showed a filial distribution of mental health disorders in the participants' family, with paternal history of schizophrenic illnesses, depression, and substance use (0.8%, 0.8% and 1.7%, respectively). The study finding equally showed that a history of schizophrenic and substance use disorders (0.8% and 1.7%) among participants' mothers and first siblings. Certain family characteristics were reported to increase the risk for depressive, schizophrenic and substance use disorders in the participants (Table 4). Further multivariate logistic regression model showed there was clearly no statistically significant difference in the way family history influences either schizophrenic or mood disorders, especially for those variables that where close to the alpha point of .05 on univariate analysis (Table 5). This result suggests that schizophrenic group and mood disorder group do not have different distal risk factors.

Table 4

Two-Way Contingency Analysis of the Relationship Between Family History of Mental Disorders and Diagnosis of Schizophrenic and Mood Disorders in Participants

Variables	Schizophrenic disorders in participants		Mood disorders in participants		Pearson's χ^2		
	n	*%*	*N*	*%*		*p-value*	*Cramer's V*
Age of onset in first degree relative:							
Paternal age (living)					1.59	.21	.14
• Middle Age	9	23.7%	29	76.3%			
• Elderly	11	37.9%	18	62.1%			
Paternal age at death					8.53	.04	.27
• Adulthood	5	62.5%	3	37.5%			
• Middle Age	8	61.5%	5	38.5%			
• Elderly	14	50.0%	14	50.0%			
Maternal age (living)					1.734	.42	.14
• Adulthood	3	33.3%	6	66.7%			
• Middle Age	20	36.4%	35	63.6%			
• Elderly	10	52.6v	9	47.4%			
Maternal age at death:					.54	.76	.13
• Adulthood	2	33.3%	4	66.7%			
• Middle Age	8	50.0%	8	50.0%			
• Elderly	5	41.7%	7	58.3%			
Maternal chronic schizophrenia	1	50.0%	1	50.0%	.07	.79	.02
Maternal schizoaffective disorder, Mania	0	0.0%	1	100.0%	.69	.41	.08

Depression in first degree relative:							
• Mother	0	0.0%	1	100.0%	.69	.41	.08
• Father	0	0.0%	1	100.0%	.68	.41	.08
• First sibling	0	0.0%	2	100.0%	1.50	.22	.50
Unspecified functional psychosis in first degree relative:							
• Father	0	0.0%	1	100.0%	.68	.41	.08
• Mother	1	100.0%	0	0.0%	1.47	.23	.11
Alcoholism in first degree relative:							
• Father	1	33.3%	2	66.7%	.07	.78	.02
• First Sibling	1	50.0%	1	50.0%	.37	.54	.25
Substance use disorder in first degree relative:							
• Father	2	100.0%	0	0.0%	2.99	.08	.17

• First Sibling	2	66.7%	1	33.3%	3.00	.08	.70

Table 5

Prevalence and Risk (OR) of Lifetime Schizophrenic and Mood Disorders in Relatives (N=114) by Participant Disorder Subgroups

Family history of mental health disorders	Schizophrenic disorders in participants	Mood disorders in participants			
Relatives	*(%)*	*(%)*	*Odds Ratio*	Cramer's V	*p-value*
Paternal depression	.8%	0.0%	2.924E+27	.225	1.00
Paternal substance use disorder	1.7%	0.0v	1.442	.217	1.00
Maternal schizophrenic disorder	.8%	.8%	.000	.787	.79
Maternal depression	0.0%	1%	.000	.406	1.00
Depression in first sibling	0.0%	1.7%	.708	1120410043	.71

Substance use disorder in first sibling	1.7%	.8%	.000	.234	1.00

Research Question 2 (RQ2):

RQ2. Is there statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence)?

$H_0$2: There is no statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence).

H_a2: There is a statistically significant difference in the way schizophrenic or mood disorders are influenced by exposure to adverse childhood experiences (including childhood abuse, household dysfunction, criminality in families, intimate partner violence).

Univariate chi square analysis showed that only exposure to intimate partner violence in early life showed strong statistically significant difference in the way it influenced schizophrenic or mood disorders in the participants (p = .01; see Table 6). The results showed that compared to mood disorders, majority of the participants with

schizophrenic disorder were more likely to have been exposed to either intimate partner violence (87.5%) or parental separation (62.5%) in early life.

Table 6

Two-Way Contingency Analysis of the Relationship Between Adverse Childhood Experiences and Schizophrenic or Mood Disorders in Participants

Adverse Childhood Experiences	Schizophrenic disorder	Mood disorder	*df*	*p-value*	*Cramers' V*
Physical abuse	52.2%	47.5%	1	.21	.11
Sexual abuse	20.0%	80.0%	1	.16	.13
Household dysfunction	35.7%	64.3%	1	.69	.04
Neglect by parents or caregiver	33.3%	66.7%	1	.64	.43
Parental separation/divorce	62.5%	37.5%	1	.06	.18
Intimate partner violence	85.7%	14.3%	1	.01	.23
Substance use in family	46.7%	53.3%	2	.41	.12
Mental illness in household	40.0%	60.0%	1	.96	.004

Criminality in family (incarceration in families)	33.3%	66.7%	1	.71	.04

Logistic regression was further carried out to ascertain whether there was a statistically significant difference in the way these adverse childhood experiences are associated with the types of mental disorder. The odds of being exposed to IPV is .107, indicating that there is a 90.3% lower likelihood of IPV being associated with schizophrenic disorders. However, the analysis showed that intimate partner violence no longer showed a statistically significant difference in the way it influenced schizophrenic or mood disorders, $\chi^2(1) = .62$, $p = .06$ (Table 7). The regression model explained 20.1% (Nagelkerke *R2*) of the variance in those that were exposed to intimate partner violence in early life and correctly classified 59.3% of cases; with 100% of those with mood disorders, but none of those with schizophrenic disorder being correctly classified.

Table 7

Summary of Logistic Regression Analysis of Association Between Adverse Childhood Experiences and Type of Mental Disorders (Schizophrenic or Mood Disorder) (N=118)

Adverse Childhood Experiences	*B*	*Wald*	*Df*	*p-value*	Odds Ratio	*CI* Upper	*CI* Lower
Physical abuse		2.724	2	.25			
Emotional abuse	1.823	2.753	1	.09	6.193	.200	2.498

Household dysfunction	-1.048	1.230	1	.26	.351	.526	18.980
Neglect by parents or caregiver	.709	.462	1	.49	2.031	.150	7.094
Parental separation/or divorced	-.766	1.390	1	.23	.465	.402	5.322
Intimate partner violence	-2.232	3.421	1	.06	.107	.025	1.371
Substance use in family		.781	2	.67			
Substance use in family(1)	-.542	.781	1	.37	.582	.330	3.669
Substance use in family(2)	-22.393	.000	1	1.00	.000	.000	
Mental illness in family	-.080	.011	1	.91	.923	.120	2.335
Criminality in family (incarceration in families)	.821	.561	1	.45	2.272	.238	14.462

Research Question 3 (RQ3):

RQ3. Are there statistically significant differences in coping strategies between patients with schizophrenia and patient with mood disorders?

$H_0$3: There are no statistically significant differences in coping strategies between patients with schizophrenia and patient with mood disorders.

Ha3: There are statistically significant differences in coping strategies between patients with schizophrenia and patient with mood disorders.

Two-way multiple analysis of variance (MANOVA) was conducted to determine whether there are statistical associations between the 2 groups of mental disorders and the nine dependent variables, i.e., coping strategies (self-blame, rumination, acceptance, positive refocusing, refocus on planning, positive appraisal, putting into perspective, catastrophizing, and other blame strategies). Multivariate tests showed there was no statistically significant mean differences in the way schizophrenic and mood disorders influenced the nine coping strategies (independent variable) used by the participants, *Wilks* Λ =.92, $F(8,109) = 1.122$, p =.32. The multivariate η^2 based on Wilks Λ was weak, .08. Thus, Schizophrenic and mood disorders were not significantly different in the manner they influence the participants' coping strategies. Table 8 contains the means and standards deviations on the dependent variables for the two groups of clinical diagnoses.

Table 8

Means and Standard Deviations o the Type of Mental Disorders for the Nine Coping Strategies

Cognitive emotional regulation strategies	Schizophrenic disorders		Mood disorders	
	M	*SD*	*M*	*SD*
Self-blame strategy	50.45	8.60	49.69	10.90
Rumination strategy	50.24	10.12	49.84	9.99
Acceptance strategy	51.68	11.13	48.84	9.04

Positive refocusing strategy	48.99	9.67	50.69	10.23
Refocus on planning strategy	50.45	8.63	49.69	10.90
Positive appraisal strategy	51.00	9.29	49.69	10.47
Putting into perspective strategy	49.31	9.094	50.47	10.61
Catastrophizing strategy	49.37	9.44	50.43	10.41
Other blame strategy	48.93	7.91	50.74	11.20

Post hoc tests were conducted as follow up tests to the MANOVA. Using the Bonferroni method, each ANOVA was tested at 0.005 level. None of the ANOVA on coping strategies was significant: self-blame, $F(1,116) = .03$, $p = .85$, $\eta^2 = .000$; rumination, $F(1,116) = .89$, $p = .35$, $\eta^2 = ..008$; acceptance, $F(1,116) = .53$, $p = .47$, $\eta^2 = ..005$; positive refocusing, $F(1,116) = .03$, $p = .86$, $\eta^2 = .000$; refocus on planning, $F(1,116) = .75$, $p = .39$, $\eta^2 = .006$; positive reappraisal, $F(1,116) = 1.90$, $p = .17$, $\eta^2 = .016$; putting into perspective, $F(1,116) = 1.40$, $p = .24$, $\eta^2 = .012$; catastrophizing, $F(1,116) = .04$, $p = .84$, $\eta^2 = .000$; and other blame, $F(1,116) = .03$, $p = .87$, $\eta^2 = .000$.

Post-hoc analyses to the univariate ANOVA for the self-blame coping strategy consisted of pairwise comparisons to find which coping strategy was affected most strongly by the type of mental health disorders. Each pairwise comparison was tested at

.005 divided by 9 or .00062 level. The rumination coping strategy produced greater effects on schizophrenic disorders in comparison with the other strategies. This was closely followed by clients' strategy of putting issues into perspective. I partially reject the null hypothesis for the rumination coping strategy and the strategy of putting issues into perspective, but failed to reject the null hypotheses for the other coping strategies.

Research Question 4 (RQ4):

RQ4. Do socioeconomic risk factors have a mediating effect on these relationships?

$H_0$4: Socioeconomic risk factors do not have a mediating effect on these relationships

Ha4: Socioeconomic risk factors have a mediating effect on these relationships

First, a bivariate logistic regression analysis conducted to determine whether there is a statistically significant difference in the way family history of mental disorders in first degree relatives influence type of mental disorders, when SES is introduced as a confounding variable. Study results shows that there is no statistically significant difference in the way schizophrenic or mood disorders are influenced by an history of mental disorder in first degree relatives, when SES is introduced as a confounder (Table 9). All the independent variables became nonsignificant. Second bivariate logistic regression analysis to ascertain whether there is a statistically significant difference in the way ACEs influence type of mental disorders when SES is introduced as a confounding variable showed that IPV became more strongly significant ($p = .02$). Other ACEs, including substance use disorder in families ($p < .01$) and SES ($p < .01$) became statistically significant (Table 10).

Further logistic regression analysis conducted to determine the influence of these three risk factors on type of mental health disorder in participants (in Table 9), showed that their clinical condition was related to only their predisposition to practice a self-blame coping strategy (a maladaptive strategy). Dummy variables of the self-blame strategy [$\chi^2(1) = 6.34$, $p = .01$] and an adaptive coping strategy (positive appraisal strategy) [$\chi^2(1) = 3.70$, $p = .05$], also remained significant predictors of type of mental disorder in the participants. However, the logistic regression analysis showed that other independent variables were no more significantly related to the participants' clinical condition. The regression model explained 44.0% (Nagelkerke *R2*) of the variance in those that had these coping strategies and correctly classified 72.6% of cases, as well as 57.4% of those with schizophrenic disorders and 82.9% of mood disorders.

A follow-on logistic regression analysis was then conducted to ascertain whether socioeconomic risk factors mediate the influence of these predictor variables on the participants' clinical condition (Table 10). Socioeconomic status was entered as an additional confounding variable to the independent variables. When SES was introduced as a confounder, there was no statistically significant difference in the way the independent variables influenced either schizophrenic or mood disorders. However, the results showed a significant overall effect (*Wald* = 4.462, *df* = 1, *p* = .03). As reported in Table 9, 10 and 11, when SES was introduced as a mediating variable in the multivariate analysis, none of the independent variables showed any significant difference in the way they influence either schizophrenic or mood disorders. This result highlights the fact that schizophrenic and mood disorder group do not have different upstream risk factors.

In the logistic regression models, the Hosmer-Lemeshow (H-L) Goodness of Fit test was not significant [X^2 (8, N = 118) = 7.406, p = .49]; hence, we fail to reject the null hypothesis implying that the model's estimates of the relationship between the occurrence of schizophrenic and mood disorders and the independent variables fit the data at an acceptable level.

Table 9

Bivariate Logistic Regression Analysis to Determine Whether Socioeconomic Risk Factors Mediate the Influence of Family History of Mental Illness in First Degree Relatives on Type of Mental Disorders in the Participants (N=118)

	B	*df*	*p-value*	*Odds ratio*	95% *C.I.* for Odds ratio Lower	Upper
Paternal substance use disorder(1)	.000	1	1.000	1.000	.000	.
Substance use disorder in first sibling (1)	42.406	1	.999	2609758947413185000.000	.000	.
Depression in first ssibling (1)	21.203	1	1.000	1615474699.886	.000	.
SES(1)	42.406	1	.999	260975917836902350 0.000	.000	.

Constant	-42.406	1	.999	.000	

Table 10

Bivariate Logistic Regression Analysis to Determine Whether Socioeconomic Risk Factors Mediate the Influence of Adverse Childhood Experiences on Type of Mental Disorders in the Participants (N=118)

					95% *CI* for Odds ratio	
	B	*df*	*p-value*	*Odds ratio*	*Lower*	*Upper*
Physical abuse	-.388	1	.56	.678	.182	2.528
Physical abuse (1)	.054	1	.94	1.056	.278	4.008
Emotional Abuse	.801	1	.40	2.227	.342	14.515
Household dysfunction (1)	.997	1	.29	2.710	.427	17.196
Neglect by parents or caregiver (1)	.062	1	.95	1.064	.154	7.359
Parental separation/or divorced (1)	.504	1	.47	1.655	.416	6.595
Intimate partner violence(1)	-1.914	1	.06	.148	.019	1.121
Substance use in family		2	1.00			

Substance use in family (1)	.002	1	.99	1.002	.299	3.363
Substance use in family (2)	21.111	1	1.00	1473467 918.456	.000	.
Mental illness in family(1)	-.731	1	.34	.481	.108	2.140
Criminality in family (incarceration in families) (1)	.609	1	.56	1.838	.239	14.107
SES		2	1.00			
SES(1)	21.751	1	.99	2795317 064.307	.000	.
SES(2)	21.753	1	.99	2801195 377.216	.000	.
Constant	-21.325	1	.99	.000		

Table 11

Bivariate Logistic Regression Analysis to Determine Whether Socioeconomic Risk Factors Mediate the Influence of Schizophrenic or Mood Disorders on the Participants Coping Strategies (N=118)

Variables	*B*	*df*	*p-value*	*OR*	*C.I.*	
					Lower	Upper
Self-blame coping strategy		6	.82			
Dummy(1)	-2.524	1	.25	.080	.001	6.395

Dummy(2)	-1.629	1	.31	.196	.008	4.669
Dummy(3)	-2.061	1	.21	.127	.005	3.193
Dummy(4)	-2.329	1	.16	.097	.004	2.544
Dummy(5)	-2.271	1	.18	.103	.004	2.925
Dummy(6)	21.355	1	.99	18811 77964.229	.000	.
Acceptance coping strategy		3	.30			
Dummy(1)	-2.784	1	.10	.062	.002	1.775
Dummy(2)	.384	1	.58	1.468	.365	5.908
Dummy(3)	-.453	1	.61	.636	.110	3.682
Dummy(1)	-.804	1	.29	.448	.100	1.997
Positive refocusing coping strategy		5	.91			
Dummy(1)	-1.054	1	.36	.348	.036	3.350
Dummy(2)	-.363	1	.76	.696	.067	7.235
Dummy(3)	-.016	1	.98	.984	.256	3.780
Dummy(4)	-20.917	1	.99	.000	.000	.
Dummy(5)	.824	1	.56	2.279	.143	36.434
Refocus on planning coping strategy		2	.74			
Dummy(1)	22.246	1	.99	45852 64578.738	.000	.
Dummy(6)	-1.627	1	.44	.197	.003	12.157
Positive reappraisal coping strategy		3	.31			
Dummy(1)	-.306	1	.81	.736	.058	9.293
Dummy(2)	-2.222	1	.07	.108	.010	1.207
Dummy(3)	.169	1	.87	1.185	.138	10.195

Putting into perspective coping strategy		6	.38			
Dummy(1)	-19.024	1	1.00	.000	.000	.
Dummy(2)	-23.995	1	1.00	.000	.000	.
Dummy(3)	-23.065	1	1.00	.000	.000	.
Dummy(4)	-22.680	1	1.00	.000	.000	.
Dummy(5)	-22.544	1	1.00	.000	.000	.
Dummy(6)	-22.782	1	1.00	.000	.000	.
Catastrophizing coping strategy		7	.77			
Dummy(1)	-.753	1	.67	.471	.014	15.374
Dummy(2)	-.094	1	.96	.910	.022	38.470
Dummy(3)	-.550	1	.74	.577	.022	15.444
Dummy(4)	-2.044	1	.25	.130	.004	4.361
Dummy(5)	-1.005	1	.59	.366	.009	14.551
Dummy(6)	-2.462	1	.32	.085	.001	11.433
Dummy(7)	-.326	1	.85	.722	.025	21.024
Other-blame coping strategy		6	.53			
Dummy(1)	21.029	1	.99	13570 82900.784	.000	.
Dummy(2)	.190	1	.80	1.209	.261	5.600
Dummy(3)	-2.118	1	.19	.120	.005	2.995
Dummy(4)	.567	1	.56	1.762	.262	11.848

Dummy(5)	19.688	1	1.00	35526 2575.099	.000	.
Dummy(6)	1.424	1	.16	4.152	.562	30.668
Constant	25.870	1	.99	17182 00688 56.930		

Chapter 5: Discussion, Conclusions, and Recommendations

Schizophrenic and mood disorders have been associated with family history (Chen et al., 2018), ACEs (Jaworska-Andryszewska & Rybakowski, 2019; Hirt et al., 2019), cognitive emotional coping strategies (Cheng et al., 2014), and socioeconomic conditions (Quon & McGrath, 2014). Agerbo et al. (2015) suggested there is often an interrelationship between these risk factors, especially socioeconomic status and family risk factors of mental disorders. Unearthing the relationships between these risk factors and the difference in how they interact to influence outcomes between the groups of mental disorders may support prevention and management interventions to reduce the morbidity associated with these diseases. Management of mental illnesses accounts for 31.5% of health care costs, with schizophrenic disorders accounting for $32.5 billion and mood disorders for $30.4 billion in the United States (Miller & Rice, 2018; Roehrig, 2016). Mental health disorders equally contribute to avoidable mortality, such that an understanding of the burden of illness and associated risk factors could save cost and preventable mortality (Trautmann et al., 2016; Walker et al., 2015).

Discussion of Findings

The COVID-19 pandemic and restriction in movement affected clinic attendance in the period when data collection for this study took place. This significantly impacted my ability to recruit a control group of non-cases without mental disorders from the outpatient unit of the study site. This constraint led to a decision to instead compare different risk profiles between two clinical groups (schizophrenic vs. mood disorder). The

study results therefore focus on examining the difference in risks profile between these groups of disorders. The hypotheses have been reviewed to reflect this adjustment.

Two broad classes of mental health disorders were compared in this study. The study findings showed that 59.3% of the respondents had mood disorders and 40.7%, schizophrenic illnesses. A similar study by Akinsulore, et al. (2014) in Nigeria had reported a prevalence (27.0%) of depressive disorders among a cohort of outpatient clients in a tertiary mental health institution in Nigeria. Another meta-analysis of studies among veterans receiving mental health treatment showed that the prevalence of schizophrenic disorders ranges between 24.9% to 43.4% (et al., 2017). Akinsulore et al. (2014) may have found a different prevalence because the authors examined the prevalence across all age groups. Though the result from my study mimicked those by Williamson, et al. (2017), the authors had focused on only individuals above 65 years and their results may not be generalizable to all age segments. Despite the similarity in the methodology between my study and that of Akinsulore, et al. (2014), the fact that they examined several more classes of mental health disorders may have accounted for the slight decrease in the prevalence they reported. Only individuals with schizophrenic and mood disorders were eligible for my own study. The study by Williamson et al. (2017) was a meta-analysis of multiple studies across time. This method of data mining may give credence to their conclusions, as well as mine. Since these mental health disorders are prevalent, it is helpful to understand how genetic predisposition is a basis for perpetuation of these mental health disorders. To do this, I examined how these extant risks differ between the groups of mental disorders in the families.

The existence of disorders in families, increases attention to understanding the difference in familial loading of risk factors between the two types of mental health disorders. The study findings showed that 0.8%, 0.8% and 1.7% respectively of the first-degree relatives had paternal schizophrenic, mood, and substance use disorders. Also, in 0.8% and 1.7% respectively of cases mothers and first sibling were also reported to share an history of schizophrenic and drug use disorder with the study participants. Chen and colleagues (2014) revealed that family history increases the risk of mental health disorders. My study showed there were statistically significant difference in the way familial risks affect the two types of mental health disorders, with paternal substance use disorder and maternal depression occurring commonly in both schizophrenic and mood disorders. However, there is a wide difference between the prevalence of paternal substance use problems and maternal depression in my study and that by Chen, et al., who reported prevalence of 73.0%. and 17.6% respectively. Similarly, Chen and colleagues found persistently strong relationships between BPD in probands and parental depression, neurosis, anxiety, and paternal substance use problems (Chen, et al., 2014). This is related to the statistically significant relationship found between parental mental health disorders and conditions in their offspring, though this relationship pales to insignificance on exposure to multivariate analysis. On the other hand, Chen et al used the same methodology and inferential statistics as the current study and this may have accounted for the similarities in our findings. The difference in the prevalence may then have arisen from the divergence in study populations used. Like this study, Hyland et al., (2016) found that female gender and a parental history of a mood or anxiety disorders are

the strongest predictors of schizophrenic and mood disorders. Like my study, Hyland et al. used logistic regression to determine the strength of the predictors, but a different methodology.

The coexistence of parental mental health disorders with other adverse family characteristics may determine mental health outcomes in individuals. Hence, it is important to understand how these risks factors influence the different mental health disease groups. I found a statistically significant difference in the way fathers' age at death (p =.04) influenced schizophrenic or mood disorders. Other authors reported similar relationships between mental health disorders and family bereavement, suggesting an increased risk of mental health problems and propensity for suicide (see Stikkelbroek et al., 2016; Hollingshaus & Smith, 2015). Berg et al. (2014) agreed with findings from the two earlier studies, identifying the association with mental health disorders and lower school grades in offspring from such families. Like Berg et al., I found that adjustments for SES changed the level of statistical significance of the relationships (Berg et al., 2014). The slight difference is that while I found a total loss of statistical significance, Berg and colleagues found a weakened association when SES is included as a moderating variable. Other major differences found are that while Hollingshaus and Smith (2015) and Berg et al. focused only on the adolescent age group, I focused on all ages. There are also variances in methodology used. These may have accounted for the difference in the level of statistical significance found. Exploring events occurring in later life could provide further insight into mental health risk.

Exposure to adversities in growing up years may negatively impact the health of individuals, such that they manifest mental health illnesses in later life. This study showed that two forms of ACEs, including exposure to parental separation and IPV showed statistically significant difference in the way they relate with the participants' type of mental health disorder (p =.01). A majority (64.3%) of participants with mood disorders had been exposed to IPV in their families, while 85.7% of participants with schizophrenic illnesses had experienced parental separation in later life. Several studies have highlighted the associations between exposure to IPV risk and later mental health disorders (e.g., Beydoun et al., 2017; Delara, 2016; Sparrow et al., 2017). While Sparrow et al. (2017) and Delara (2017) conducted systematic review of literature, Beydoun et al. (2017) used a secondary review of medical records from the 2010 Healthcare Cost and Utilization Project's Nationwide Emergency Department sample. In spite of the differences in methodologies used, all authors reported similar strong (although with wide ranging differences) statistical relationship between IPV and mental health in later life. The similarities in findings by these authors and mine may be adduced to the analogous study settings. Many of the authors had reported findings from studies conducted in a healthcare setting. Examining the influence of other risk factors on the mental health outcome in individuals could provide interesting results.

The overall functioning in people with mental health disorders may be predicated on their ability to find effective ways to manage psychological stress. I examined the variance in correlation between individual's coping strategies with the two classes of mental health disorders. My study highlights the statistically significant difference in the

way schizophrenic and mood disorders are related to individuals' cognitive coping strategies. The results indicate there is stronger relationship between the type of mental health disorders and maladaptive coping strategies like self-blame (p = .03) and catastrophizing (p = .04), than with adaptive strategies such as positive appraisal (p = .05). However, when subjected to multivariate logistic regression analysis, there was no more statistically significant difference in the way participants' propensity towards using a self-blame coping strategy influenced schizophrenic and mood disorders (p = .06). Holubova and colleagues (2015, 2016) reported similar positive associations between maladaptive coping strategies (p-value ranging between .01 to.05) and psychopathology rating in subjects with schizophrenic illness. The comparable outcomes found between studies by Holubova et al. and this study may be due to the similarities in sample size, methodology, and the heterogeneous nature of the population that was used. Like the two earlier authors, Jalbrzikowski et al. (2015) reported a strong relationship between maladaptive coping strategies and clinical risk of psychosis. However, the study by Jalbrzikowski and colleagues was a prospective assessment involving two control groups of healthy and non-healthy clients, hence offering a stronger argument in respect of causal relationships between psychotic disorders and the maladaptive coping risk factor. Similarly, the findings of my study agree with those from Marquez-Arrico et al. (2015) agreed and those by the three earlier authors. It would be expected that the difference in methodology and the rather narrow concentration on individuals with substance use disorders (with and without schizophrenic disorder) would skew the findings by Marquez-Arrico and colleagues. The strength of association between coping and mental

health outcomes is buttressed by the veracity of these findings. Further findings from their control study inferred that the patients with schizophrenic disorder are less likely to use positive strategies, than population of non-schizophrenic individuals (Marquez-Arrico et al., 2015). Individual's ability to maintain optimal mental health outcomes in later life is therefore predicated on their ability to cope, but may also be related to other social causes. Identifying the influence of such socioeconomic conditions could strengthen our conclusions.

An understanding of the predictive risk of SES, as well as the social and economic quintiles, on life outcomes could provide useful background as to why people manifest mental health disorders in later life. Majority of the respondents in this study belonged to either the low (55.6%) or medium (41.9%) socioeconomic group. Logistic regression analysis showed there was no statistically significant (p = .78), direct relationship, between SES and type of mental health disorders in my study participants. However, when bivariate logistic regression when conducted to ascertain if there was statistically significant difference in the way ACEs or the coping strategies influence the type of mental disorder, with SES being introduced as a mediating variable; I found that none of the coping strategies remained statistically significant in the way they influenced the two disorders. A further multivariate logistic regression analysis highlighted the fact that that all independent variables including family history, ACEs, and cognitive coping strategies did not show any statistically significant difference in the way they influence the two mental health disorders when SES is introduced as a mediating variable.

This study results can only identify the patterns of relationships and difference in outcomes for the two groups of mental health disorders examined, but not the causal relationships since I used a cross-sectional rather than a longitudinal method and only samples of clients with mental disorders. The results showed that SES moderated the effect of the two coping strategies (self-blame and positive appraisal coping strategies) on the mental health outcome of the participants. Just like findings from this study, Kinderman et al. (2015) reported that the association between life events and mood disorders is mediated by rumination. Accortt et al. (2008) agreed with the findings from Kinderman et al. suggesting that when individuals are exposed to risks (like a tendency towards ruminative coping strategies, among other risks) there is an increased susceptibility towards major depressive disorders. The results of my study are also in agreement with Accortt et al. and Kinderman et al. Using other theoretic models, researchers have also reinforced the strength of association between coping and mental health disorders (Gloria& Steinhardt, 2016; Ornell et al., 2020). Despite difference in methodologies, the outcomes in this study and the earlier highlighted one were similar. Further confirmation, using longitudinal designs and case-control methodology, could strengthen the claims from my study. My results may not be generalizable to all populations as I focused solely on individuals with two classes of mental health disorders (schizophrenic and mood disorders) and I had no control group without mental disorders. However, the conditional independence map identified pathways that are consistent with prevailing understanding of mechanism in these two classes of mental disorders (see Kinderman et al., 2013).

Rothman's Sufficient-Component Cause Theory

The components of the sufficient-component cause theory were taken into account when generating the hypotheses for this study. The sufficient-component cause theory illustrates the importance of the following: multicausality, strength of a cause, interaction among causes, and the sum of attributable fraction for each component cause (Rothman & Greenland, 2005). The central notion of the theory is that individuals are often susceptible to multiple diseases and that the outcome of each disease is multi-factorial, resulting from co-occurrence of several factors (VanderWeele, 2017).

The model also draws attention to processes, pathways, or mechanisms by which an exposure brings about a disease. With respect to the first and second hypotheses, the findings of insignificant influence of family characteristics and early adverse experiences on the clinical conditions in the participants indicate that there is no difference in the way the history of mental health disorders in families and adversity in early life, predict an outcome in either schizophrenic or mood disorders. However, there is a difference in the way an individual's ability to cope with adverse conditions affect an outcome on their mental health.

My dissertation used the constructs within the framework to examine the pathways that exist between upstream risk factors (exposure) like family history of mental illness in first degree relatives, adverse early experiences, and individual coping strategies leading to the outcome. The result showed that while upstream family risk, ACEs, and ability to cope with stressors may individually contribute to the types of mental disorder, an examination of the role of multicausality indicated that a sufficient

correlation is found only with component coping strategies. The study also showed that SES has limited mediating effect on the degree of statistical significance of the component risk factors, like ACEs. Chen and Lee (2018) suggested that the moderating effect of a mediator may influence the causal relationship between exposure and disease. When the mediator is involved, it then becomes important to breakdown the effect into a direct or indirect effect. According to Chen and Lee,) an indirect effect is that which is mediated by the mediator while direct effect is that which is not mediated by the mediator.

Examining the relative risk of upstream factors using the lens of causal pathways permits integration of all information derivable from representative cases of mental illnesses that are sampled and provides a base for the conclusions that are derived from this dissertation. However, in my study, none of the tested upstream component causes show a demonstrable statistical significance in their relationship with either schizophrenic or mood disorders or produced effects that qualified them as sufficient causes. Further studies, using disease versus nondisease group of participants may provide more in-depth information on these relationships and generate a better base for classification of the risk factors.

Limitations

One hundred and eighteen clients and first degree relative of individuals with schizophrenia and mood disorders were interviewed personally using a structured questionnaire that has variables from the FDH-RH, CERQ, and ACE-Q tools. The findings highlight the influence of upstream ACEs, family history, and coping strategies

on mental health outcomes in the two mental health disorders sampled but does not show the outcome in other classes of mental health disorders nor in general populations without mental health disorders. Beyond use of clinical and familial information, future studies focusing on identifying research criteria for subtyping schizophrenia and mood disorders should also utilize other non-familial variables and biological markers.

A major limitation with this study is that I did not have a control group without mental health disorder. This constraint arose from the COVID-19 pandemic outbreak and restriction in movement. There was significant reduction in clinic attendance, such that it was impossible to get recruit participants from the outpatient department of my study site. This constraint led to a decision to instead compare different risk profiles between two clinical groups (schizophrenic vs. mood disorder). Another limitation was that the study results were based on participants providing truthful responses. Using an interviewer-administered data collection technique limits the population of people that can be reached (Williamson, 2002); hence, the sample does not reflect the general population in terms of such demographic variables as socioeconomic status. This limits the generalizability of my findings.

Study participants were selected using the convenience sampling technique, a non-probability sampling technique, also known as ‘haphazard or accidental sampling’ (see Etikan, Musa, & Alkassim, 2016). Non probability sampling is used in situations where population is not well defined, or they are at the right place when needed (Etikan, Musa, & Alkassim, 2016). Convenience sampling was used in this study as only the patients with mental disorders meet the inclusion criteria and were selected. This

technique was also due to the fact that I was only able to enroll participants based on their accessibility and availability.

Aside the earlier mentioned limitations, the data collection tools used in this study had a number of limitations. A major limitation of the ACE-Q instrument was that it does not separate out, or reasonably measure the individual influences of stand-alone traumatic experiences like physical vs sexual abuse in childhood, hereditary, or overall environmental conditions (such as premature death of parental figures or poverty) that contribute to the overall causal pathway (see Anda et al., 2009; Lipina & Posner, 2012). Many of the items in the ACE-Q are bundled together, increasing the chances of confounding (Zarse, et. Al, 2019). Multiple forms and sources of ACEs are added together as a single score, e.g., two questions: recall of inadequate food and shelter and negligent parents as a result of intoxication are bundled together (Zarse, et. al, 2019). On a deeper examination, one will find that each of these questions may form a separate score. Therefore, in spite of the fact that the ACE-Q is broadly sensitive to recall of neglect, the tool does not identify the specific form of neglect, its root causes, timing in the development process and duration of exposure to the stressors (Zarse, et. al, 2019).

The FH-RDC questionnaire, used in this study to assess the history of mental health disorders in the families, is an advancement of direct history method (Andreasen, et al., 1977). However, according to Andreasen, et al. (1977), underestimation remains a significant problem with the use of the tool. Andreasen, et al. suggested that follow on family studies be conducted where conceivable. Inability to conduct such exhaustive family studies constituted a limitation for this study.

The CERQ-short questionnaire that was used in this study was selected due to space and time limitations. The reduction in number of items in the 18-item CERQ-short may affect the overall validity and stability of the findings (see Garnefski & Kraaij, 2006). According to Garnefski & Kraaij (2006), where time and space permits, the 36-item version of the CERQ is preferable. Also, it is difficult to determine the sensitivity of the CERQ to change of each item, especially since the purpose of the CERQ is to measure individual's coping resources both at a time and across a period (Holgado-Tello et al., 2018).

The study findings may not be generalizable to all populations, as the study focuses only on individuals with schizophrenic and mood disorders. It is equally notable that the convenience sampling technique used in this study presents a challenge with external validity of the findings. Responses to questions about mental distress and well-being may be affected by gender, education, socioeconomic status or a personal history of mental health problems.

Recommendations for Further Study

If there was more resources or time, I would have liked to add a control group, maybe from the communities. Including the controls would allow me to make meaningful inferences on the true association between the upstream risk factors and mental health disorders. I could recruit participants from either the hospital's outpatient unit or Karu community, who have homogenous characteristics as the study participants. Case-control study design provides an efficient way of estimating the relative risks due to various

exposures and are less costly, more practical and effective than cohort studies (Yada, 2017).

Further research into the relation between upstream family history, childhood adversities, individual coping strategies and socioeconomic implications could help answer questions about the interplay of these risks and their influence on mental health outcomes in later life. Action should continue to be taken to ameliorate or decrease the exposure to these deleterious factors in the life course of individuals. These actions may involve interventions targeting promotive or preventative mental health, including programs that help to develop resiliency through coping strategies for those exposed to adversities in childhood. Due to the negative effect of childhood adversity on latter life; it may be best to combat such adversities early in life, to support populations in living a healthy life in adulthood. Continuing education on the deleterious effect of family dysfunction and parental separation on mental health outcomes in adulthood could be helpful

Exploration of extant coping strategies in response to stress and other adversities could support further understanding of the role emotional cognitive strategies play in etiology of mental health. Further studies examining the individual's ability to cope with stress, and inferences on how these strategies influence mental health outcome will continue to be needed. Programs targeted at empowering individuals to adopt healthy coping strategies, will reduce the harmful effects of stress on mental health in adulthood. Counselling on problem-solving strategies has been used to support individuals to adopt varied approaches to solving problems, and finding answers that address stressful events

(Labrague, et al., 2017). Strengthening this type of interventions will reinforce health measures at ameliorating the negative consequences of stress and by extension their detrimental effect on mental health. Further genetic and family studies could provide deeper information on the role of heredity in mental disorder. It is equally necessary to continue to explore how these factors interact with other risks like: adversities in childhood and individuals' innate traits that help them to adjust to stressors.

Findings from this study, could help inform continuing medical education courses for both medical doctors and mental health professionals. Such programs could improve information and approaches to managing individuals with mental disorders, that is related to coping with difficulties when addressing life challenges, exposure to adversities in childhood, or familial loading of psychological illnesses. In addition, the findings may be valuable for educationist and the school systems, providing information on how mental disorders in their students may be linked to any of the aforementioned risks. The outcome from this study will equally be useful for training school administrators and support staff who are able to address mental health problems. In the study setting, teachers are expected to report incidences of child abuse to legal authorities (Fayokun & Adedeji, 2013. However, further attention needs to paid to developing mechanisms through which reports of such adverse events or any other observed innate challenges with coping can be made to counsellors.

Programs addressing family disharmony or familial origin of diseases will support individuals, students and families to address mental health issues. Such programs will target reflective problem-solving and will be made available to all individuals requiring

the intervention. Facilities that offer these services can be linked up with schools and other social outlets that attend to individuals that are exposed to these risks.

Lastly, attention to educating the general public about the early signs of abuse and identification of individuals with coping challenges and how to report them will support mental health prevention efforts. There has been an established linkage between childhood trauma and later criminal or antisocial behaviors (Fox et al., 2015; Reaviset al., 2013; Friestad, Åse-Bente & Kjelsberg, 2014; Wolffet al., 2018). Therefore, legal practitioners and other individuals working in the legal system could benefit from education on the ways childhood adversity affect behavior. Fox et al., found a significant correlation between history of childhood trauma, abuse, neglect, criminal behavior, and latter criminal behavior in 22,575 offending youth referred to the Florida Department of Juvenile Justice (Fox et al., 2015). Fox et al. suggested that with every additional adverse event a child experiences, there is an increased risk of becoming violent and an enduring juvenile offender by the age of 35 years. There was a further suggestion that legal practitioners use ACE score as a first-line screening tool in identification of children at risk of serious offences before they commit more grievous offences (Fox et al., 2015). Based on these findings, it is recommended that juvenile detention centers employ mental health professional or include mental health services that can support individuals to avoid the adaptation of risky and negative behaviors as a result of experiencing an adverse childhood event, as well as include teaching of reflective problem-solving techniques in rehabilitation curricula to transform the manner in which these individuals choose to deal with difficulties.

Implications for Social Change

Understanding the risk factors for mental health disorders could contribute to the quality of care for individuals with the disorder. Elucidating the association between these etiologic factors and mental illness can be useful resource for those affected by mental illnesses and their family. Such insight or understanding may help them better adjust to the challenges of managing the illness. Clinicians and psychologists who manage these affected individuals in resource-constrained settings should have a unique glimpse of the interrelationship between these associative factors and the client's socioeconomic circumstances. The study findings highlight the need to explore the influence of socioeconomic factors when managing people with mental health disorders. It is hoped that clinicians begin to pay attention to conditions that potentiate the effect of existing risks in etiogenesis of mental health disorders. The study underscores the role of socioeconomic disadvantage in further deterioration of an individual's cognitive emotional regulation and ability to cope with social stressors.

The finding of positive relationships between family history of mental illness in first degree relatives and downstream mental disorder, further underlines the critical need to focus community and social interventions on healthy family life. Early attention to building resiliency programs that target positive coping strategies in individuals (with family history of mental illness) could present downstream advantage, preventing latter deterioration in mental health in first degree relatives. Such programs may support individuals to build a positive locus of control and orientation towards supporting other members of affected families. Hinden et al. worked with several directors of programs

targeting families with mental disorders and found a cross-cutting agreement on need for targeting community context towards developing programs that support locus of care; as well as essential services and family-centered, strengths-based approaches to managing mental health disorders (Hinden et al., 2006).

Increasing awareness about these upstream risk factors may help improve visibility for the mental illnesses, creating opportunities for targeted development interventions by program managers. I hope that the present study is resource material for further studies, generating research interests and discussions on the true relations existing between upstream factors and mental health disorders in sub-Saharan Africa.

Conclusion

Exposure to upstream risk factors like adverse childhood experiences, family history of mental disorders, maladaptive coping strategies, or poor socioeconomic conditions have been found to have negative effects in later adult life (Hirt, Schalinski & Rockstroh, 2019; Jaworska-Andryszewska & Rybakowski, 2019). This study was conducted to investigate possible associations between mental illness and upstream adversity in childhood, family history, and individual coping strategies. In addition, there was an interest in examining whether socioeconomic conditions had a moderating effect on the upstream risk factors, with a view to understanding the pathway for such relationships.

The study highlights the contribution of upstream risks like childhood adversity, family history and individual coping methods to etiology of mental illness. The genetic constitution in families play prominent roles in the outcomes in offspring from such

homes. The loss of a father, parental substance use (especially by the father) and substance abuse by a first sib of the proband significantly influenced their mental health outcome. The study result shows the interesting paradigm deviation from the traditional maternal single-mindedness, highlighting the role fathers play in the health of families. It equally lays further credence to the familial root of mental health disorders in families. Although genetic typing will provide further evidence and insight, these finding is a justification for enduring focus on investigating and targeting interventions at offspring of families with genetic predisposition to mental illnesses.

The results also showed that when exposed to IPV in early life, individuals are at risk of later mood disorders in adult life. Children that witness these violent and often traumatic abuse of a weaker parent manifested later adverse mental health outcomes. The result showed that larger population of the individuals with schizophrenic illnesses had witnessed such violence in their childhood. These finding, makes an additional case for continuing emphasis on examination for early adversity when managing people with specific mental disorders.

Cognitive emotional regulation and function was found to be a major contributor to mental health outcome in this study. With increasing tendencies to use maladaptive self-blame coping methods, individuals are at risk of developing mental health disorders. The results equally showed significant mean difference between the outcome in mood disorders, compared to those with schizophrenic disorders, when individuals use such adaptive strategies, like positive appraisal. As recommended above, with attention to supporting people to develop a positive locus of control, mental health practitioners may

achieve better mental health prevention and treatment outcomes. When rigorous statistical analysis is applied, only individual's coping strategies showed continuing relationship with mental health outcomes. Furthermore, though slightly moderated by the influence of socioeconomic conditions, the relationship between an individual's reflective method of coping and their mental health outcome remains significant.

After reviewing all these findings from the study, it is recommended that future exploration focus on effect of social and economic factors on coping mechanisms in later life. Also, additional action towards improving psychoeducation and interventions that aim at supporting individuals to build positive coping mechanisms could reduce the long-term disabilities to which they are predisposed. Outcomes from further investigations to understand genetic prototypes in families, as well as qualitative role of IPV could be helpful resource for educating professionals and the general public on contribution of these risks to mental health disorders. Finally, it is hoped that continuing research and programs could provide an understanding of the interplay of these mental health risks, and that the incidence of such factors decrease as the society becomes increasingly aware of influence of family, early home environment, socioeconomic and coping methods on outcomes in adulthood.

References

Adhvaryu, A., Fenske, J., & Nyshadham, A. (2019). Early life circumstance and adult mental health. *Journal of Political Economy*, *127*(4), 1516-1549.

Afe, T. O., Emedoh, T. C., Ogunsemi, O., & Adegbohun, A. A. (2016). Intimate partner violence, psychopathology and the women with schizophrenia in an outpatient clinic South-South, Nigeria. *BMC Psychiatry*, *16*(1), 1-8.

Afifi, T. O. Mota, N., MacMillan, H. L., & Sareen, J. (2013). Harsh physical punishment in childhood and adult physical health. *Pediatrics*, *132*(2), e333-e340

Agerbo, E., Sullivan, P. F., Vilhjalmsson, B. J., Pedersen, C. B., Mors, O., Børglum, A. D., ... & Ripke, S. (2015). Polygenic risk score, parental socioeconomic status, family history of psychiatric disorders, and the risk for schizophrenia: a Danish population-based study and meta-analysis. *JAMA Psychiatry*, *72*(7), 635-641.

Akinsulore, A., Aloba, O. O., Mapayi, B. M., Oloniniyi, I. O., Fatoye, F. O., & Makanjuola, R. O. A. (2014). Relationship between depressive symptoms and quality of life in Nigerian patients with schizophrenia. *Social Psychiatry and Psychiatric Epidemiology*, *49*(8), 1191-1198.

Algorani, E. B., & Gupta, V. (2021). Coping mechanisms. StatPearls [Internet]

Alhusen, J. L., Ray, E., Sharps, P., & Bullock, L. (2015). Intimate partner violence during pregnancy: maternal and neonatal outcomes. *Journal of Women's Health*, *24*(1), 100-106.

Alhusen, J. L., Lucea, M. B., Bullock, L., & Sharps, P. (2013). Intimate partner violence, substance use, and adverse neonatal outcomes among urban women. *Journal of Pediatrics, 163*(2), 471-476.

American Psychiatric Association (n.d.). *Diagnostic and statistical manual of mental disorders,* (5th ed.). American Psychiatric Association. http://dsm.psychiatryonline.org/doi/book/10.1176/appi.books.9780890425596

American Psychological Association (2016). *Socioeconomic status*. http://www.apa.org/topics/socioeconomic-status/

Anda, R. F., Brown, D. W., Felitti, V. J., Bremner, J. D., Dube, S. R., & Giles, W. H. (2007). Early Adverse Experiences Questionnaire [Database record]. Retrieved from PsycTESTS. https://dx.doi.org/10.1037/t09620-000

Anda, R. F., Dong, M., Brown, D. W., Felitti, V. J., Giles, W. H., Perry, G. S., … Dube, S. R. (2009). The relationship of adverse childhood experiences to a history of premature death of family members. *BMC Public Health, 9*, 106. https://dx.doi.org/10.1186/1471-2458-9-106

Andreasen, N. C., Endicott, J., Spitzer, R. L., & Winokur, G. (1977). The family history method using diagnostic criteria: reliability and validity. *Archives of General Psychiatry*, *34*(10), 1229-1235.

Arditti, J. A. (2016). A family stress-proximal process model for understanding the effects of parental incarceration on children and their families. *Couple and Family Psychology: Research and Practice*, *5*(2), 65.

Assari, S. (2017). Race, sense of control over life, and short-term risk of mortality among older adults in the United States. *Archives of Medical Science*, *13*(5), 1233.

Assari, S., & Caldwell, C. H. (2018). High risk of depression in high-income African American boys. *Journal of Racial and Ethnic Health Disparities*, *5*(4), 808-819.

Assari, S., Moazen-Zadeh, E., Lankarani, M. M., & Micol-Foster, V. (2016). Race, depressive symptoms, and all-cause mortality in the United States. *Frontiers in Public Health*, *4*, 40.

Atwoli, L., Stein, D. J., Koenen, K. C., & McLaughlin, K. A. (2015). Epidemiology of posttraumatic stress disorder: prevalence, correlates and consequences. *Current Opinion in Psychiatry, 28*(4), 307.

Berk, L. E. (2000). *Child development* (5th ed.). Allyn & Bacon.

Awad, A. R., Elkiey, M., & Alnabawy, A. (2014). Study of socioepidemiological characteristics and risk factors of neuropsychiatric disorders in sample of Egyptian children. *Asian Academy of Management Journal 12*(4).

Babenko, O., Kovalchuk, I., & Metz, G. A. (2015). Stress-induced perinatal and transgenerational epigenetic programming of brain development and mental health. *Neuroscience & Biobehavioral Reviews*, *48*, 70-91.

Baglioni, C., Nanovska, S., Regen, W., Spiegelhalder, K., Feige, B., Nissen, C., Reynolds, C.F. & Riemann, D. (2016). Sleep and mental disorders: A meta-analysis of polysomnographic research. *Psychological Bulletin*, *142*(9), 969.

Baker, L. M., Williams, L. M., Korgaonkar, M. S., Cohen, R. A., Heaps, J. M., & Paul, R. H. (2013). Impact of early vs. late childhood early life stress on brain morphometrics. *Brain Imaging and Behavior, 7*(2), 196-203.

Bakker, A. B., & Demerouti, E. (2018). Multiple levels in job demands-resources theory: Implications for employee well-being and performance. *Handbook of Well-Being*.

Baqutayan, S. M. S. (2015). Stress and coping mechanisms: A historical overview. Mediterranean Journal of Social Sciences, 6(2 S1), 479-479.

Batty, G. D., Mortensen, E. L., & Osler, M. (2005). Childhood IQ in relation to later psychiatric disorder: evidence from a Danish birth cohort study. *British Journal of Psychiatry*; *187*, 180–181.

Bault, N., Fahrenfort, J. J., Pelloux, B., Ridderinkhof, K. R., & van Winden, F. (2017). An affective social tie mechanism: Theory, evidence, and implications. *Journal of Economic Psychology, 61*, 152-175.

Beauchaine, T. P., Constantino, J. N., & Hayden, E. P. (2018). Psychiatry and developmental psychopathology: Unifying themes and future directions. *Comprehensive Psychiatry, 87*, 143-152.

Ben-David, V., Jonson-Reid, M., Drake, B., & Kohl, P. L. (2015). The association between childhood maltreatment experiences and the onset of maltreatment perpetration in young adulthood controlling for proximal and distal risk factors. *Child Abuse & Neglect, 46*, 132-141.

Berg, L., Rostila, M., Saarela, J., & Hjern, A. (2014). Parental death during childhood and subsequent school performance. *Pediatrics*, *133*(4), 682-689.

Berglund, D., & Koski, T. (2019). On Probabilistic Multifactor Potential Outcome Models. http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-259607

Beydoun, H. A., Williams, M., Beydoun, M. A., Eid, S. M., & Zonderman, A. B. (2017). Relationship of physical intimate partner violence with mental health diagnoses in the nationwide emergency department sample. *Journal of Women's Health*, *26*(2), 141-151.

Bradshaw, M., Kent, B. V., Henderson, W. M., & Setar, A. C. (2017). Subjective social status, life course SES, and BMI in young adulthood. *Health Psychology*, 36(7), 682.

Braveman, P. A., Cubbin, C., Egerter, S., et al. (2005). Socioeconomic Status in Health Research: One size does not fit all. *Journal of the American Medical Association, 294*(22), 2879–2888. https://dx.doi.org/10.1001/jama.294.22.2879

Britto, P. R., Lye, S. J., Proulx, K., Yousafzai, A. K., Matthews, S. G., Vaivada, T., Perez-Escamilla, R., Rao, N., Ip, P., Fernald, L.C. & MacMillan, H. (2017). Nurturing care: Promoting early childhood development. *Lancet, 389*(10064), 91-102.

Bigdeli, T. B., Ripke, S., Bacanu, S. A., Lee, S. H., Wray, N. R., Gejman, P. V., Rietschel, M., Cichon, S., St Clair, D., Corvin, A. & Kirov, G. (2016). Genome-wide association study reveals greater polygenic loading for schizophrenia in cases with a family history of illness. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics, 171*(2), 276-289.

Bijl, N., Thys, C., Wittevrongel, C., De la Marche, W., Devriendt, K., Peeters, H., Van Geet, C. and Freson, K. & Freson, K. (2015). Platelet studies in autism spectrum disorder patients and first-degree relatives. *Molecular Autism*, *6*(1), 57.

Bielas, H., Barra, S., Skrivanek, C., Aebi, M., Steinhausen, H. C., Bessler, C., & Plattner, B. (2016). The associations of cumulative adverse childhood experiences and irritability with mental disorders in detained male adolescent offenders. *Child and Adolescent Psychiatry and Mental Health*, *10*(1), 34.

Bizouarn, P. (2012). Kenneth J. Rothman and multicausality in epidemiology. *Revue D'Epidemiologie et de Sante Publique*, *60*(1), 59-69.

Björkenstam, E., Kosidou, K., & Björkenstam, C. (2016). Childhood household dysfunction and risk of self-harm: a cohort study of 107 518 young adults in Stockholm County. *International Journal of Epidemiology*, 45(2), 501-511.

Blasco, M. J., Vilagut, G., Almenara, J., Roca, M., Piqueras, J. A., Gabilondo, A., Lagares, C., Soto-Sanz, V., Alayo, I., Forero, C.G. & Echeburúa, E. (2019). Suicidal thoughts and behaviors: Prevalence and association with distal and proximal factors in Spanish university students. *Suicide and Life-Threatening Behavior*, *49*(3), 881-898.

Bohacek, J., Gapp, K., Saab, B. J., & Mansuy, I. M. (2013). Transgenerational epigenetic effects on brain functions. *Biological Psychiatry*, *73*(4), 313-320.

Bora, E. (2015). Developmental trajectory of cognitive impairment in bipolar disorder: comparison with schizophrenia. *European Neuropsychopharmacology*, *25*(2), 158-168.

Bora, E., & Pantelis, C. (2016). Meta-analysis of social cognition in attention-deficit/hyperactivity disorder (ADHD): comparison with healthy controls and autistic spectrum disorder. *Psychological medicine*, 46(4), 699-716.

Borneman, K. (2016). Quality of Caregiving Representations Among Pregnant Mothers Experiencing Intimate Partner Violence. *Senior Honors Theses & Projects*. 473. https://commons.emich.edu/honors/473

Borsboom, D. (2017). A network theory of mental disorders. *World psychiatry*, *16*(1), 5-13.

Botvinick, M., & Braver, T. (2015). Motivation and cognitive control: from behavior to neural mechanism. *Annual review of psychology*, *66*.

Braver, T. S. (2012). The variable nature of cognitive control: a dual mechanisms framework. *Trends in cognitive sciences*, 16(2), 106-113.

Briere, J. & Runtz, M. (1990). Differential adult symptomatology associated with three types of child abuse histories. *Child Abuse & Neglect*.;14:357–364.

Bruggink, A., Huisman, S., Vuijk, R., Kraaij, V., & Garnefski, N. (2016). Cognitive emotion regulation, anxiety and depression in adults with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *22*, 34-44.

Bruni, A., Carbone, E. A., Pugliese, V., Aloi, M., Calabrò, G., Cerminara, G., ... & De Fazio, P. (2018). Childhood adversities are different in schizophrenic spectrum disorders, bipolar disorder and major depressive disorder. *BMC psychiatry*, 18(1), 1-7.

Bucchianeri, M. M., Fernandes, N., Loth, K., Hannan, P. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2016). Body dissatisfaction: Do associations with disordered eating and psychological well-being differ across race/ethnicity in adolescent girls and boys? *Cultural Diversity and Ethnic Minority Psychology*, *22*(1), 137.

Budge, S. L., Adelson, J. L., & Howard, K. A. (2013). Anxiety and depression in transgender individuals: The roles of transition status, loss, social support, and coping. *Journal of consulting and clinical psychology*, *81*(3), 545.

Bujang, M. A., Ab Ghani, P., Zolkepali, N. A., Adnan, T. H., Ali, M. M., Selvarajah, S., & Haniff, J. (2012, September). A comparison between convenience sampling versus systematic sampling in getting the true parameter in a population: explore from a clinical database: the Audit Diabetes Control Management (ADCM) registry in 2009. In *2012 International Conference on Statistics in Science, Business and Engineering*, 1-5). IEEE.

Burns, J. K. (2015). Poverty, inequality and a political economy of mental health. *Epidemiology and Psychiatric Sciences, 24*(2), 107-113. http://dx.doi.org.ezp.waldenulibrary.org/10.1017/S2045796015000086

Burns, J. K., Tomita, A., & Kapadia, A. S. (2014). Income inequality and schizophrenia: increased schizophrenia incidence in countries with high levels of income inequality. *International Journal of Social Psychiatry*, *60*(2), 185-196.

Byrne, J., Hauck, Y., Fisher, C., Bayes, S., & Schutze, R. (2014). Effectiveness of a mindfulness-based childbirth education pilot study on maternal self-efficacy and fear of childbirth. *Journal of midwifery & women's health*, *59*(2), 192-197.

Cambridge University Press (2018). In Cambridge One. Challenges in recruitment of research participants. *Advances Title history*. *Advances in Psychiatric Treatment*, 9(3), pp. 229-238

Carnegie Mellon University (n.d.). Chapter 16: Analyzing Experiments with Categorical Outcomes Analyzing data with non-quantitative outcomes). https://chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.stat.cmu.edu%2F~hseltman%2F309%2FBook%2Fchapter16.pdf&clen=248932&chunk=true

Centers for Disease Control and Prevention (2019). Violence Prevention: About Adverse Childhood Experiences. https://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/aboutace.html

Charman, T., Young, G. S., Brian, J., Carter, A., Carver, L. J., Chawarska, K., Curtin, S., Dobkins, K., Elsabbagh, M., Georgiades, S. & Hertz-Picciotto, I. (2017). Non-ASD outcomes at 36 months in siblings at familial risk for autism spectrum disorder (ASD): A baby siblings research consortium (BSRC) study. *Autism Research*, *10*(1), 169-178.

Chavarria, J., Rueger, S. Y., & King, A. C. (2018). Hangover in Post-College-Aged Drinkers: Psychometric Properties of the Hangover Symptom Scale (HSS) and the

Hangover Symptom Scale—Short Form (HSS-5). *Alcoholism: clinical and experimental research*, *42*(6), 1122-1131.

Chen, C., & Lee, W. C. (2018). Attributing diseases to multiple pathways: a causal-pie modelling approach. *Clinical epidemiology*, 10, 489.

Chen, L., Selvendra, A., Stewart, A., & Castle, D. (2018). Risk factors in early and late onset schizophrenia. *Comprehensive psychiatry*, *80*, 155-162.

Chen, Y. C., Kao, C. F., Lu, M. K., Yang, Y. K., Liao, S. C., Jang, F. L., Chen, W.J., Lu, R.B. & Kuo, P. H. (2014). The relationship of family characteristics and bipolar disorder using causal-pie models. *European Psychiatry*, *29*(1), 36-43.

Cheng, C. M., Chang, W. H., Chen, M. H., Tsai, C. F., Su, T. P., Li, C. T., Tsai, S.J., Hsu, J.W., Huang, K.L., Lin, W.C. & Chen, T. J. (2018). Co-aggregation of major psychiatric disorders in individuals with first-degree relatives with schizophrenia: a nationwide population-based study. *Molecular psychiatry*, *23*(8), 1756-1763.

Cheng, C., Lau, H. P. B., & Chan, M. P. S. (2014). Coping flexibility and psychological adjustment to stressful life changes: A meta-analytic review. *Psychological bulletin,* 140(6), 1582.

Von Cheong, E., Sinnott, C., Dahly, D., & Kearney, P. M. (2017).. Adverse childhood experiences (ACEs) and later-life depression: perceived social support as a potential protective factor. *BMJ Open*; 7:e013228. https://dx.doi.org/10.1136/bmjopen-2016-013228

Cheung, C., Yu, K., Fung, G., Leung, M., Wong, C., Li, Q., Sham, P., Chua, S. & McAlonan, G. (2010). Autistic disorders and schizophrenia: related or remote? An anatomical likelihood estimation. *PloS one*, 5(8), e12233.

Child Welfare Information Gateway (2019). Definitions of Child Abuse and Neglect. https://www.childwelfare.gov/topics/systemwide/laws-policies/statutes/define/

Choi, N. G., DiNitto, D. M., Marti, C. N., & Choi, B. Y. (2017). Association of adverse childhood experiences with lifetime mental and substance use disorders among men and women aged 50+ years. *International Psychogeriatrics*, 29(3), 359-372. http://dx.doi.org.ezp.waldenulibrary.org/10.1017/S1041610216001800

Chou, T., Asnaani, A., & Hofmann, S. G. (2012). Perception of racial discrimination and psychopathology across three US ethnic minority groups. *Cultural Diversity and Ethnic Minority Psychology*, *18*(1), 74.

Claussen, A. H. & Crittenden, P. M. (1991). Physical and psychological maltreatment (relations among types of maltreatment). *Child Abuse & Neglect;*15:5–18.

Clemens, V., Berthold, O., Witt, A., Sachser, C., Brähler, E., Plener, P. L., Strauß, B. & Fegert, J. M. (2019). Child maltreatment is mediating long-term consequences of household dysfunction in a population representative sample. *European psychiatry*, *58*, 10-18.

Collins, S. E. (2016). Associations between socioeconomic factors and alcohol outcomes. *Alcohol research: current reviews*, *38*(1), 83.

Colman, I., Garad, Y., Zeng, Y., Naicker, K., Weeks, M., Patten, S. B., Jones, P. B., Thompson, A. H., & Wild, T. C. (2012). Stress and development of depression

and heavy drinking in adulthood: moderating effects of childhood trauma. Social Psychiatry *Psychiatric Epidemiology*. https://dx.doi.org/10.1007/s00127-012-0531-8

Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., ... & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological bulletin*, *143*(9), 939.

Compton, M. T., & Shim, R. S. (2015). The social determinants of mental health. *Focus*, *13*(4), 419-425.

Compas, B. E., Jaser, S. S., Dunn, M. J., & Rodriguez, E. M. (2012). Coping with chronic illness in childhood and adolescence. *Annual review of clinical psychology*, 8, 455-480.

Copeland, K. T., Checkoway, H., McMichael, A. J. & Holbrook, R. H. (1977). Bias due to misclassification in the estimation of relative risk. *American Journal of Epidemiology*; 105: 488-95.

Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.

Cross-Disorder Group of the Psychiatric Genomics Consortium (2013). Identification of risk loci with shared effects on five major psychiatric disorders: a genome-wide analysis. *Lancet*; 381:1371–9.

Cuijpers, P., & Smit, F. (2001). Assessing parental alcoholism: A comparison of the Family History Research Diagnostic Criteria versus a single-question method. *Addictive Behaviors*, *26*(5), 741-748.

Culbert, K. M., Racine, S. E., & Klump, K. L. (2015). Research Review: What we have learned about the causes of eating disorders–a synthesis of sociocultural, psychological, and biological research. *Journal of Child Psychology and Psychiatry*, 56(11), 1141-1164.

Cummings, E. M., & Miller-Graff, L. E. (2015). Emotional security theory: An emerging theoretical model for youths' psychological and physiological responses across multiple developmental contexts. *Current Directions in Psychological Science*, *24*(3), 208-213.

Cypress, B. S. (2017). Rigor or reliability and validity in qualitative research: Perspectives, strategies, reconceptualization, and recommendations. *Dimensions of Critical Care Nursing*, *36*(4), 253-263.

Da Luz, F. Q., Sainsbury, A., Hay, P., Roekenes, J. A., Swinbourne, J., Da Silva, D. C., & Oliveira, D. S. (2017). Early maladaptive schemas and cognitive distortions in adults with morbid obesity: relationships with mental health status. *Behavioral sciences*, 7(1), 10)

Daniels, J. L., Forssen, U., Hultman, C. M., Cnattingius, S., Savitz, D. A., Feychting, M., & Sparen, P. (2008). Parental psychiatric disorders associated with autism spectrum disorders in the offspring. *Pediatrics*, 121(5), e1357-e1362.

Dargan, S., Daigneault, I., Ovetchkine, P., Jud, A., & Frappier, J. Y. (2019). Association between child sexual abuse and infectious disease diagnoses. Child abuse & neglect, 97, 104142.

Daulatzai, M. A. (2015). Evidence of neurodegeneration in obstructive sleep apnea: relationship between obstructive sleep apnea and cognitive dysfunction in the elderly. *Journal of neuroscience research*, *93*(12), 1778-1794.

Bora, E., & Pantelis, C. (2016). Meta-analysis of social cognition in attention-deficit/hyperactivity disorder (ADHD): comparison with healthy controls and autistic spectrum disorder. *Psychological medicine*, 46(4), 699-716.

Davis, W. S. (2015). Association between psychological trauma from assault in childhood and metabolic syndrome (Doctoral dissertation, Walden University).

Delara, M. (2016). Mental health consequences and risk factors of physical intimate partner violence. *Mental health in family medicine*, *12*(1), 119-125.

DeShong, H. L., Tucker, R. P., O'Keefe, V. M., Mullins-Sweatt, S. N., & Wingate, L. R. (2015). Five factor model traits as a predictor of suicide ideation and interpersonal suicide risk in a college sample. *Psychiatry research*, 226(1), 217-223.

D'Onofrio, B. M., Rickert, M. E., Frans, E., Kuja-Halkola, R., Almqvist, C., Sjölander, A., Larsson, H. & Lichtenstein, P. (2014). Paternal age at childbearing and offspring psychiatric and academic morbidity. *JAMA psychiatry*, *71*(4), 432-438.

Donkin, A., Goldblatt, P., Allen, J., Nathanson, V., & Marmot, M. (2018). Global action on the social determinants of health. *BMJ global health*, *3*(Suppl 1).

Donovan, R. A., & West, L. M. (2015). Stress and mental health: Moderating role of the strong black woman stereotype. *Journal of Black Psychology*, *41*(4), 384-396.

Dube, S. R., Williamson, D. F., Thompson, T., Felitti, V. J., & Anda, R. F. (2004). Assessing the reliability of retrospective reports of adverse childhood experiences among adult HMO members attending a primary care clinic. *Child Abuse & Neglect*, 28(7), 729–737.

Dunn, E. C., Nishimi, K., Powers, A., & Bradley, B. (2017). Is developmental timing of trauma exposure associated with depressive and post-traumatic stress disorder symptoms in adulthood? *Journal of psychiatric research*, *84*, 119-127.

Elfil, M., & Negida, A. (2017). Sampling methods in Clinical Research; an Educational Review. *Emergency (Tehran, Iran)*, *5*(1), e52.

El-Gilany, A., El-Wehady, A., & El-Wasify, M. (2012). Updating and validation of the socioeconomic status scale for health research in Egypt. *Eastern Mediterranean Health Journal*, *18*(9).

Endicott, J. (1978). *Family History: Research Diagnostic Criteria:(FH-RDC)*. New York State Psychiatric Institute.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, *5*(1), 1-4.

Ezeme, M. S., Uwakwe, R., Ndukuba, A. C., Igwe, M. N., Odinka, P. C., Amadi, K., & Obayi, N. O. (2016). Socio-demographic correlates of treatment response among

patients with schizophrenia in a tertiary hospital in South-East Nigeria. *African health sciences*, 16(4), 1036-1044.https://doi.org/10.4314/ahs.v16i4.21.

Fahmy, S. & El-Sherbini, A. F. (1983). Determining simple parameters for social classifications for health research. *Bulletin of the High Institute of Public Health*, 13:95–108.

Fahmy, S. I., Nofal, L. M., Shehata, S. F., El Kady, H. M., & Ibrahim, H. K. (2015). Updating indicators for scaling the socioeconomic level of families for health research. *Journal of the Egyptian Public Health Association*, *90*(1), 1-7.

Farris, S. G., Metrik, J., Bonn-Miller, M. O., Kahler, C. W., & Zvolensky, M. J. (2016). Anxiety sensitivity and distress intolerance as predictors of cannabis dependence symptoms, problems, and craving: The mediating role of coping motives. *Journal of studies on alcohol and drugs*, 77(6), 889-897.

Fayokun, K. O. & Adedeji, S. O. (2013). Legal Issues in Educational Management in Nigeria. *Makerere Journal of Higher Education,* http://dx.doi.org/10.4314/majohe.v4i2.5

Felitti, V. J. (1998). The relationship of adult health status to childhood abuse and household dysfunction. *American Journal of Preventive Medicine, 14*, 245-258.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., ... & Marks, J. S. (2019). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, 56(6), 774-786.

Fernandes, V., & Osório, F. L. (2015). Are there associations between early emotional trauma and anxiety disorders? Evidence from a systematic literature review and meta-analysis. *European Psychiatry*, *30*(6), 756-764.

Finkelhor, D., Turner, H., Shattuck, A., Hamby, S., & Kracke, K. (2015). Children's exposure to violence, crime, and abuse: An update. Washington, DC: US Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.

Fisher, J., Mello, M. C. D., Patel, V., Rahman, A., Tran, T., Holton, S., & Holmes, W. (2012). Prevalence and determinants of common perinatal mental disorders in women in low-and lower-middle-income countries: a systematic review. *Bulletin of the World Health Organization*, *90*, 139-149.

Fiske, S. T. (2015). Intergroup biases: A focus on stereotype content. *Current opinion in behavioral sciences*, *3*, 45-50.

Forrest-Bank, S. S., & Jenson, J. M. (2015). The relationship among childhood risk and protective factors, racial microaggression and ethnic identity, and academic self-efficacy and antisocial behavior in young adulthood. *Children and youth services review*, *50*, 64-74.

Foster, H., & Hagan, J. (2017). Maternal imprisonment, economic marginality, and unmet health needs in early adulthood. *Preventive medicine*, *99*, 43-48.

Fox, B. H., Perez, N., Cass, E., Baglivio, M. T., & Epps, N. (2015). Trauma changes everything: Examining the relationship between adverse childhood experiences

and serious, violent and chronic juvenile offenders. *Child Abuse & Neglect*, 46, 163-173.

Fuller-Thomson, E., Brennenstuhl, S., & Frank, J. (2010). The association between childhood physical abuse and heart disease in adulthood: Findings from a representative community sample. *Child Abuse & Neglect*, 34(9), 689-698.

Fuller-Thomson, E., Roane, J. L., & Brennenstuhl, S. (2016). Three types of adverse childhood experiences, and alcohol and drug dependence among adults: an investigation using population-based data. *Substance Use & Misuse*, *51*(11), 1451-1461.

Haskins, A. R., Amorim, M., & Mingo, M. (2018). Parental incarceration and child outcomes: Those at risk, evidence of impacts, methodological insights, and areas of future work. *Sociology compass*, *12*(3), e12562.

Hinden, B. R., Biebel, K., Nicholson, J., Henry, A., & Katz-Leavy, J. (2006). A survey of programs for parents with mental illness and their families: Identifying common elements to build the evidence base. The Journal of Behavioral Health Services & Research, 33(1), 21-38.

Frasquilho, D., Matos, M. G., Salonna, F., Guerreiro, D., Storti, C. C., Gaspar, T., & Caldas-de-Almeida, J. M. (2015). Mental health outcomes in times of economic recession: a systematic literature review. *BMC public health*, *16*(1), 115.

Friestad, C., Åse-Bente, R., & Kjelsberg, E. (2014). Adverse childhood experiences among women prisoners: Relationships to suicide attempts and drug abuse. *International journal of social psychiatry*, 60(1), 40-46.

Fritz, F., Tilahun, B., & Dugas, M. (2015). Success criteria for electronic medical record implementations in low-resource settings: a systematic review, *Journal of the American Medical Informatics Association*, 22(2), 479-488. https://doi.org/10.1093/jamia/ocu038

Funahashi, Y., Yoshino, Y., Yamazaki, K., Ozaki, Y., Mori, Y., Mori, T., Ochi, S., Iga, J.I. & Ueno, S. I. (2019). Analysis of methylation and-141C Ins/Del polymorphisms of the dopamine receptor D2 gene in patients with schizophrenia. *Psychiatry research*, *278*, 135-140.

Fusar-Poli, P., Tantardini, M., De Simone, S., Ramella-Cravaro, V., Oliver, D., Kingdon, J., Kotlicka-Antczak, M., Valmaggia, L., Lee, J., Millan, M.J. & Galderisi, S. (2017). Deconstructing vulnerability for psychosis: Meta-analysis of environmental risk factors for psychosis in subjects at ultra-high-risk. *European Psychiatry*, *40*, 65-75.

Gale, C. R., Batty, G. D., Tynelius P., & Deary, I. J. (2010). Rasmussen F. Intelligence in early adulthood and subsequent hospitalization for mental disorders. *Epidemiology;* 21: 70–77.

Galek, K., Flannelly, K. J., Ellison, C. G., Silton, N. R., & Jankowski, K. R. (2015). Religion, meaning and purpose, and mental health. *Psychology of Religion and Spirituality*, *7*(1), 1.

Garcia, M.D. O., Garnica, M.V. M., Marin, S. G., Martinez, C. M., Martinez, R. G., del Valle, P. B. & Bernal, M.A. L. (2017). Psychiatric disorders run in families.

Children of parents with serious mental disorders: A case history. *European Psychiatry*, 41(Supplement), S219. https://doi.org/10.1016/j.eurpsy.2017.01.2204

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and depression. *Personality and Individual Differences, 30,* 1311–1327

Gaston, S. (2016). The long-term effects of parental incarceration: does parental incarceration in childhood or adolescence predict depressive symptoms in adulthood? *Criminal Justice and Behavior*, *43*(8), 1056-1075.

Ghirardi, L., Brikell, I., Kuja-Halkola, R., Freitag, C. M., Franke, B., Asherson, P., Lichtenstein, P. & Larsson, H. (2018). The familial co-aggregation of ASD and ADHD: a register-based cohort study. *Molecular psychiatry*, *23*(2), 257-262.

Gilbert, L. K., Breiding, M. J., Merrick, M. T., Thompson, W. W., Ford, D. C., Dhingra, S. S., & Parks, S. E. (2015). Childhood adversity and adult chronic disease: an update from ten states and the District of Columbia, 2010. *American journal of preventive medicine*, *48*(3), 345-349.

Gillen, B., Snowberg, E., & Yariv, L. (2019). Experimenting with measurement error: Techniques with applications to the caltech cohort study. *Journal of Political Economy*, *127*(4), 1826-1863.

Gilroy, H., McFarlane, J., Maddoux, J., & Sullivan, C. (2016). Homelessness, housing instability, intimate partner violence, mental health, and functioning: A multi-year cohort study of IPV survivors and their children. *Journal of Social Distress and the Homeless*, *25*(2), 86-94.

Gloria, C. T., & Steinhardt, M. A. (2016). Relationships among positive emotions, coping, resilience and mental health. *Stress and Health*, *32*(2), 145-156. Gloria, C. T., & Steinhardt, M. A. (2016). Relationships among positive emotions, coping, resilience and mental health. *Stress and Health*, 32(2), 145-156.

Glover, V. (2015). Prenatal stress and its effects on the fetus and the child: possible underlying biological mechanisms. In *Perinatal programming of neurodevelopment* (pp. 269-283). Springer, New York, NY.

Godsland, I. F., Crook, D., Simpson, R., Proudler, T., Felton, C., Lees, B., ... & Wynn, V. (1990). The effects of different formulations of oral contraceptive agents on lipid and carbohydrate metabolism. *New England Journal of Medicine*, 323(20), 1375-1381.

Goel, S., Obeng, A., & Rothschild, D. (2015). Non-representative surveys: Fast, cheap, and mostly accurate. In *Working Paper*.

Gmel, G., & Daeppen, J. B. (2007). Recall Bias for Seven-Day Recall Measurement of Alcohol Consumption Among Emergency Department Patients: Implications for Case-Crossover Designs. *Journal of Studies on Alcohol and Drugs*, *68*(2), 303-310.

Grzywacz, J. G., & Bass, B. L. (2003). Work, family, and mental health: testing different models of work-family fit. *Journal of Marriage and Family*, *65*(1), 248-261. http://aging.wisc.edu/midus/findings/pdfs/155.pdf

Hajizadeh, M., Mitnitski, A., & Rockwood, K. (2016). Socioeconomic gradient in health in Canada: Is the gap widening or narrowing? *Health Policy*, *120*(9), 1040-1050.

Haimi, M., & Lerner, A. (2016). The impact of parental separation and divorce on the health status of children, and the ways to improve it. *Journal of Clinical & Medical Genomics*, 1-7.

Hamby, S. (2017). On defining violence, and why it matters. https://web-b-ebscohost-com.ezp.waldenulibrary.org/ehost/pdfviewer/pdfviewer?vid=1&sid=7b401df1-830b-4617-b9d1-e53b61d0eed5%40pdc-v-sessmgr05

Hannaford, P. C., & Kay, C. R. (1989). Oral contraceptives and diabetes mellitus. BMJ: *British Medical Journal*, 299(6711), 1315.

Hardeveld, F., Spijker, J., De Graaf, R., Nolen, W. A., & Beekman, A. T. F. (2013). Recurrence of major depressive disorder and its predictors in the general population: results from The Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Psychological medicine*, *43*(1), 39-48.

Hardt, J., Vellaisamy, P., & Schoon, I. (2010). Sequelae of prospective versus retrospective reports of adverse childhood experiences. *Psychological Reports*, 107(2), 425–440. https://dx.doi.org/10.2466/02.04.09.10.16.21.PR0.107.5.425-440

Hardy, J. (2018). Parental Incarceration's Effect on Family: Effects on Mothers, Fathers, Marriage, Children, and Socioeconomic Status. *Canadian Journal of Family and Youth/Le Journal Canadien de Famille et de la Jeunesse*, *10*(1), 119-140.

Haskins, A. R. (2015). Paternal incarceration and child-reported behavioral functioning at age 9. *Social Science Research*, *52*, 18-33.

Haskins, A. R., Amorim, M., & Mingo, M. (2018). Parental incarceration and child outcomes: Those at risk, evidence of impacts, methodological insights, and areas of future work. *Sociology compass*, *12*(3), e12562.

He, H., Wu, H., Yang, L., Gao, F., Fan, Y., Feng, J., & Ma, X. (2016). Associations between dopamine D2 receptor gene polymorphisms and schizophrenia risk: a PRISMA compliant meta-analysis. *Neuropsychiatric disease and treatment*, *12*, 3129.

Health and Human Services (n.d.). What is child abuse or neglect? What is the definition of child abuse and neglect? https://www.hhs.gov/answers/programs-for-families-and-children/what-is-child-abuse/index.html

Healthy People 2020 (2011). General Health Status. http://healthypeople.gov/2020/about/GenHealthAbout.aspx.

Herrenkohl, T. I., Hong, S., Klika, J. B., Herrenkohl, R. C., & Russo, M. J. (2013). Developmental impacts of child abuse and neglect related to adult mental health, substance use, and physical health. *Journal of family violence*, 28(2), 191-199.

Herval, Á. M., & de Mello Rode, S. (2018). Advances required for epidemiological studies. *Journal of Oral Research*, *7*(6), 226-227.

Hirt, V., Schalinski, I., & Rockstroh, B. (2019). Decoding the impact of adverse childhood experiences on the progression of schizophrenia. *Mental Health & Prevention*, *13*, 82-91.

Ho, B. C., Barry, A. B., & Koeppel, J. A. (2018). Impulsivity in unaffected adolescent biological relatives of schizophrenia patients. *Journal of psychiatric research*, *97*, 47-53.

Holgado-Tello, F. P., Amor, P. J., Lasa-Aristu, A., Domínguez-Sánchez, F. J., & Delgado, B. (2018). Two new brief versions of the Cognitive Emotion Regulation Questionnaire and its relationships with depression and anxiety. *Anales De Psicología/Annals of Psychology*, *34*(3), 458-464.

Holubova, M., Prasko, J., Hruby, R., Kamaradova, D., Ociskova, M., Latalova, K., & Grambal, A. (2015). Coping strategies and quality of life in schizophrenia: cross-sectional study. *Neuropsychiatric disease and treatment*, *11*, 3041.

Holubova, M., Prasko, J., Hruby, R., Latalova, K., Kamaradova, D., Marackova, M., ... & Gubova, T. (2016). Coping strategies and self-stigma in patients with schizophrenia-spectrum disorders. *Patient preference and adherence*, *10*, 1151.

Hong, J. (2018). Subjective Social Status and Unhealthy Behaviors among South Korean Adults. *American journal of health behavior*, 42(5), 100-116.

Hovens, J. G., Giltay, E. J., Wiersma, J. E., Spinhoven, P., Penninx, B. W., & Zitman, F. G. (2012). Impact of childhood life events and trauma on the course of depressive and anxiety disorders. *Acta psychiatrica scandinavica*, 126(3), 198-207.

Hser, Y. I., Lanza, H. I., Li, L., Kahn, E., Evans, E., & Schulte, M. (2015). Maternal mental health and children's internalizing and externalizing behaviors: Beyond maternal substance use disorders. *Journal of child and family studies*, *24*(3), 638–648. https://doi.org/10.1007/s10826-013-9874-3

Hu, Y., Wang, Y., & Liu, A. (2017). The influence of mothers' emotional expressivity and class grouping on Chinese preschoolers' emotional regulation strategies. *Journal of Child and Family Studies, 26*(3), 824-832.

Hu, T., Zhang, D., Wang, J., Mistry, R., Ran, G., & Wang, X. (2014). Relation between emotion regulation and mental health: a meta-analysis review. Psychological reports, 114(2), 341-362

Hudson, J. I., Pope, H. G., Jonas, J. M., & Yurgelun-Todd, D. (1983). Family history study of anorexia nervosa and bulimia. *The British Journal of Psychiatry, 142*(2), 133-137.

Hughes, K., Lowey, H., Quigg, Z., & Bellis, M. A. (2016). Relationships between adverse childhood experiences and adult mental well-being: results from an English national household survey. *BMC public health,* 16(1), 222.

Hume, D. (2000). An enquiry concerning human understanding: A critical edition (Vol. 3). Oxford University Press.

Hutton, J. S., Horowitz-Kraus, T., Mendelsohn, A. L., DeWitt, T., Holland, S. K., & C-Mind Authorship Consortium. (2015). Home reading environment and brain activation in preschool children listening to stories. *Pediatrics, 136*(3), 466-478.

Hyland, P., Shevlin, M., Elklit, A., Christoffersen, M., & Murphy, J. (2016). Social, familial and psychological risk factors for mood and anxiety disorders in childhood and early adulthood: a birth cohort study using the Danish Registry System. *Social psychiatry and psychiatric epidemiology, 51*(3), 331-338.

Hyun-Uk, S., Chang-Wan, H, & Masahiro, K. (2010). Social Mobility and Psychiatric Disabilities: An Assessment of the Social Causation and Social Selection Hypotheses. *Tohoku Journal of. Experimental Medicine,* 222, 23-31.

Igbolo, M. A., & Adaka, S. S. (2017). Labour Migration in The Federal Capital Territory: Examining Its Impact On The Socio-Economic Development Of Gwagwalada Area Council, Abuja. *IOSR Journal of Humanities and Social Science, 22*, 4-19.

Ioannidis, C. A., & Siegling, A. B. (2015). Criterion and incremental validity of the emotion regulation questionnaire. *Frontiers in psychology*, *6*, 247.

Ireland, M. J., Clough, B. A., & Day, J. J. (2017). The cognitive emotion regulation questionnaire: Factorial, convergent, and criterion validity analyses of the full and short versions. *Personality and Individual Differences*, *110,* 90-95.

Isomura, K., Boman, M., Rück, C., Serlachius, E., Larsson, H., Lichtenstein, P., & Mataix-Cols, D. (2015). Population-based, multi-generational family clustering study of social anxiety disorder and avoidant personality disorder. *Psychological Medicine*, *45*(8), 1581-1589.

Jackson, D. B., & Vaughn, M. G. (2017). Parental incarceration and child sleep and eating behaviors. *The Journal of pediatrics*, 185, 211-217.

Jacob, K. S. (2015). Recovery model of mental illness: A complementary approach to psychiatric care. *Indian journal of psychological medicine*, *37*(2), 117.

Jalbrzikowski, M., Sugar, C. A., Zinberg, J., Bachman, P., Cannon, T. D., & Bearden, C. E. (2014). Coping styles of individuals at clinical high risk for developing psychosis. *Early intervention in psychiatry*, *8*(1), 68-76.

Jaworska-Andryszewska, P., & Rybakowski, J. K. (2019). Childhood trauma in mood disorders: neurobiological mechanisms and implications for treatment. *Pharmacological Reports*, *71*(1), 112-120.

Jeong, H. G., Lim, J. S., Lee, M. S., Kim, S. H., Jung, I. K., & Joe, S. H. (2013). The association of psychosocial factors and obstetric history with depression in pregnant women: focus on the role of emotional support. *General hospital psychiatry*, *35*(4), 354-358.

Johns Hopkins University (n.d.). Overview of mood disorders. http://www.hopkinsmedicine.org/healthlibrary/conditions/mental_health_disorders/overview_of_mood_disorders_85,P00759/

Johnson, J. M. (2017). Horror stories and the construction of child abuse. In *Images of issues* (pp. 17-32). Routledge.

Johnson, E. I., & Easterling, B. (2012). Understanding unique effects of parental incarceration on children: Challenges, progress, and recommendations. *Journal of Marriage and Family*, 74(2), 342-356.

Joseph. J. (2013). Why the emporer (still) has no genes. In: Read J, Dillon J, editors. Models of madness: psychological, social and biological approaches to psychosis. Hove: Routledge.

Joyce, S., Modini, M., Christensen, H., Mykletun, A., Bryant, R., Mitchell, P. B., & Harvey, S. B. (2016). Workplace interventions for common mental disorders: a systematic meta-review. *Psychological medicine*, *46*(4), 683-697.

Kaiser, K. L., Barry Hultquist, T., & Chen, L. W. (2016). Maternal health-seeking on behalf of low-income children. *Public Health Nursing*, *33*(1), 21-31.

Kajeepeta, S., Gelaye, B., Jackson, C. L., & Williams, M. A. (2015). Adverse childhood experiences are associated with adult sleep disorders: a systematic review. *Sleep medicine, 16*(3), 320-330.

Kamal, A. (2015). Co-Morbid Medical Disorders in First Degree Relatives of Probands With Bipolar Mood Disorder. *Journal of Rawalpindi Medical College*, *19*(1), 82-83.

Kang H. (2013). The prevention and handling of the missing data. *Korean journal of anesthesiology*, 64(5), 402–406. https://doi.org/10.4097/kjae.2013.64.5.402

Kang, H. J., Kim, J. M., Stewart, R., Kim, S. Y., Bae, K. Y., Kim, S. W., ... & Yoon, J. S. (2013). Association of SLC6A4 methylation with early adversity, characteristics and outcomes in depression. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *44*, 23-28.

Kansas State University (2015). Dysfunctional Families: Recognizing and Overcoming Their Effects. http://www.k-state.edu/counseling/topics/relationships/dysfunc.html#whatisadysfunctionalfamily

Karatekin, C. (2018). Adverse childhood experiences (ACEs), stress and mental health in college students. *Stress and Health, 34*(1), 36-45.

Katz, L. F., Stettler, N., & Gurtovenko, K. (2016). Traumatic stress symptoms in children exposed to intimate partner violence: The role of parent emotion socialization and children's emotion regulation abilities. *Social Development, 25*(1), 47-65.

Kelley, M. L., Lawrence, H. R., Milletich, R. J., Hollis, B. F., & Henson, J. M. (2015). Modeling risk for child abuse and harsh parenting in families with depressed and substance-abusing parents. *Child abuse & neglect*, *43*, 42-52.

Kerker, B. D., Zhang, J., Nadeem, E., Stein, R. E., Hurlburt, M. S., Heneghan, A., ... & Horwitz, S. M. (2015). Adverse childhood experiences and mental health, chronic medical conditions, and development in young children. *Academic pediatrics*, *15*(5), 510-517.

Khandaker, G. M., Cousins, L., Deakin, J., Lennox, B. R., Yolken, R., & Jones, P. B. (2015). Inflammation and immunity in schizophrenia: implications for pathophysiology and treatment. *The Lancet Psychiatry*, *2*(3), 258-270.

Kiburi, S. K., Molebatsi, K., Obondo, A., & Kuria, M. W. (2018). Adverse childhood experiences among patients with substance use disorders at a referral psychiatric hospital in Kenya. *BMC psychiatry*, *18*(1), 197.

Kibuuka, H., Guwatudde, D., Kimutai, R., Maganga, L., Maboko, L., Watyema, C., ... & Robb, M. (2009). Contraceptive use in women enrolled into preventive HIV vaccine trials: experience from a phase I/II trial in East Africa. *PLoS One*, *4*(4), e5164.

Kinderman, P., Tai, S., Pontin, E., Schwannauer, M., Jarman, I., & Lisboa, P. (2015). Causal and mediating factors for anxiety, depression and well-being. *The British Journal of Psychiatry*, 206(6), 456-460.

Kinderman, P., Schwannauer, M., Pontin, E., Tai, S. (2013). Psychological processes mediate the impact of familial risk, social circumstances and life events on mental health. PLoS One; 8: e76564.

Kopak, A. M., & Smith-Ruiz, D. (2016). Criminal justice involvement, drug use, and depression among African American children of incarcerated parents. *Race and Justice*, 6(2), 89-116.

Kundakovic, M., & Champagne, F. A. (2015). Early-life experience, epigenetics, and the developing brain. *Neuropsychopharmacology*, *40*(1), 141-153.

Kuru, E., Safak, Y., Özdemir, İ., Tulacı, R. G., Özdel, K., Özkula, N. G., & Örsel, S. (2018). Cognitive distortions in patients with social anxiety disorder: Comparison of a clinical group and healthy controls. The European Journal of Psychiatry, 32(2), 97-104;

Kraaij, V., & Garnefski, N. (2019). The behavioral emotion regulation questionnaire: development, psychometric properties and relationships with emotional problems and the cognitive emotion regulation questionnaire. *Personality and Individual Differences*, *137*, 56-61.

Kruglanski, A. W., Shah, J. Y., Fishbach, A., & Friedman, R. (2018). A theory of goal systems. In *The motivated mind* (pp. 215-258). Routledge.

Kuo, J. R., Khoury, J. E., Metcalfe, R., Fitzpatrick, S., & Goodwill, A. (2015). An examination of the relationship between childhood emotional abuse and borderline personality disorder features: The role of difficulties with emotion regulation. *Child abuse & neglect*, *39*, 147-155.

Labrague, L. J., McEnroe-Petitte, D. M., Gloe, D., Thomas, L., Papathanasiou, I. V., & Tsaras, K. (2017). A literature review on stress and coping strategies in nursing students. *Journal of Mental Health*, 26(5), 471-480

Lam, L. T. (2015). Parental mental health and Internet addiction in adolescents. *Addictive behaviors*, *42*, 20-23.

Langer, Á. I., Schmidt, C., Mayol, R., Díaz, M., Lecaros, J., Krogh, E., Pardow, A., Vergara, C., Vergara, G., Pérez-Herrera, B. & Villar, M. J. (2017). The effect of a mindfulness-based intervention in cognitive functions and psychological well-being applied as an early intervention in schizophrenia and high-risk mental state in a Chilean sample: Study protocol for a randomized controlled trial. *Trials*, *18*(1), 1-9.

Langley-Evans, S. C. (2015). Nutrition in early life and the programming of adult disease: a review. *Journal of Human Nutrition and Dietetics*, *28*, 1-14.

La Placa, V., & Corlyon, J. (2016). Unpacking the relationship between parenting and poverty: Theory, evidence and policy. *Social Policy and Society*, *15*(1), 11-28.

Larsson, H., Ryden, E., Boman, M., Långström, N., Lichtenstein, P., & Landen, M. (2013). Risk of bipolar disorder and schizophrenia in relatives of people with

attention-deficit hyperactivity disorder. *The British Journal of Psychiatry,* 203(2), 103-106.

Lee, M. A. (2015). Emotional abuse in childhood and suicidality: The mediating roles of re-victimization and depressive symptoms in adulthood. *Child Abuse & Neglect, 44*, 130-139.

Leahy, R. L. (Ed.). (2015). *Contemporary cognitive therapy: Theory, research, and practice*. Guilford Publications.

León, J., Núñez, J. L., & Liew, J. (2015). Self-determination and STEM education: Effects of autonomy, motivation, and self-regulated learning on high school math achievement. *Learning and Individual Differences*, *43*, 156-163.

Lidegaard, Ø., Løkkegaard, E., Svendsen, A. L., & Agger, C. (2009). Hormonal contraception and risk of venous thromboembolism: National follow-up study. *British Medical Journal*, 339.

Lindström, M., & Rosvall, M. (2015). Parental separation in childhood, social capital, and suicide thoughts and suicide attempts: a population-based study. *Psychiatry research*, *229*(1-2), 206-213.

Linscott, R. J., & Van Os, J. (2013). An updated and conservative systematic review and meta-analysis of epidemiological evidence on psychotic experiences in children and adults: on the pathway from proneness to persistence to dimensional expression across mental disorders. *Psychological medicine*, *43*(6), 1133-1149.

Lipina, S. J., & Posner, M. I. (2012). The impact of poverty on the development of brain networks. Frontiers in Human Neuroscience, 6, 238. https://dx.doi.org10.3389/fnhum.2012.00238

Liu, Y., Croft, J. B., Chapman, D. P., Perry, G. S., Greenlund, K. J., Zhao, G., & Edwards, V. J. (2013). Relationship between adverse childhood experiences and unemployment among adults from five US states. *Social psychiatry and psychiatric epidemiology*, 48(3), 357-369.

Longden, E., Sampson, M., & Read, J. (2016). Childhood adversity and psychosis: generalised or specific effects? *Epidemiology and psychiatric sciences*, *25*(4), 349-359.

Lopizzo, N., Bocchio Chiavetto, L., Cattane, N., Plazzotta, G., Tarazi, F. I., Pariante, C. M., Riva, M.A. & Cattaneo, A. (2015). Gene–environment interaction in major depression: focus on experience-dependent biological systems. *Frontiers in psychiatry*, *6*, 68.

Lubianca, J. N., Moreira, L. B., Gus, M., & Fuchs, F. D. (2005). Stopping oral contraceptives: an effective blood pressure-lowering intervention in women with hypertension. *Journal of human hypertension*, 19(6), 451-455.

Lee, J., & Jezewski, M. A. (2007). Attitudes toward oral contraceptive use among women of reproductive age: a systematic review. *Advances in Nursing Science*, *30* (1), E85-E103.

Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., Kelly, P., Smith, J., Raine, L. & Biddle, S. (2016). Physical activity for cognitive and

mental health in youth: a systematic review of mechanisms. *Pediatrics, 138*(3), e20161642.

Lucas, N., Nicholson, J. M., & Erbas, B. (2013). Child mental health after parental separation: The impact of resident/non-resident parenting, parent mental health, conflict and socioeconomics. *Journal of Family Studies,* 19(1), 53-69.

Lucas, R. (2012). Frameworks for Causal Inference in Epidemiology. INTECH Open Access Publisher.

Lund, C., Brooke-Sumner, C., Baingana, F., Baron, E. C., Breuer, E., Chandra, P., Haushofer, J., Herrman, H., Jordans, M., Kieling, C. & Medina-Mora, M. E. (2018). Social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews. *The Lancet Psychiatry*, *5*(4), 357-369.

Makwe, E., & Ahmad, H. A. (2017). Gender inequality in household water provision: consequences on women and children in Gwagwalada Area Council, Federal Capital Territory, Nigeria. *Confluence J Environ Stud*, *11*(1), 117-131.

Manczak, E. M., Williams, D., & Chen, E. (2017). The role of family routines in the intergenerational transmission of depressive symptoms between parents and their adolescent children. *Journal of abnormal child psychology*, *45*(4), 643-656.

Mandil A. (2004). Causal Inference in Epidemiology. University of Pittsburgh. www.pitt.edu/~super4/33011-34001/33971.ppt

Maniglio, R. (2015). Significance, nature, and direction of the association between child sexual abuse and conduct disorder: a systematic review. *Trauma, Violence, & Abuse*, *16*(3), 241-257.

Mann, C. J. (2003). Observational research methods. Research design II: cohort, cross sectional, and case-control studies. *Emergency Medicine Journal*, 20(1), 54-60.

Mann, C. J. (2012). Observational research methods:Cohort studies, cross sectional studies, and case–control studies. *African Journal of Emergency Medicine*, *2*(1), 38-46.

Mansournia, M. A., Jewell, N. P., & Greenland, S. (2018). Case–control matching: effects, misconceptions, and recommendations. *European journal of epidemiology*, *33*(1), 5-14.

Marioni, R. E., Proust-Lima, C., Amieva, H., Brayne, C., Matthews, F. E., Dartigues, J. F., & Jacqmin-Gadda, H. (2015). Social activity, cognitive decline and dementia risk: a 20-year prospective cohort study. *BMC public health*, *15*(1), 1089.

Marmet, S., Studer, J., Rougemont-Bücking, A. & Gmel, G. (2018). Latent profiles of family background, personality and mental health factors and their association with behavioural addictions and substance use disorders in young Swiss men. *European Psychiatry*, 52, 76-84. https://doi.org/10.1016/j.eurpsy.2018.04.003

Marmot, M., & Allen, J. J. (2014). Social determinants of health equity. *American journal of public health*, 104 Suppl 4(Suppl 4), S517–S519. https://doi.org/10.2105/AJPH.2014.302200Marshall, B. D., & Galea, S. (2015). Formalizing the role of agent-based modeling in causal inference and epidemiology. *American journal of epidemiology*, *181*(2), 92-99.

Marshall, M., Shannon, C., Meenagh, C., Mc Corry, N., & Mulholland, C. (2018). The association between childhood trauma, parental bonding and depressive

symptoms and interpersonal functioning in depression and bipolar disorder. *Irish journal of psychological medicine, 35*(1), 23-32.

Martin, E. (2017). Hidden consequences: The impact of incarceration on dependent children. *National Institute of Justice Journal*, *278*, 1-7.

Martinez-Torteya, C., Bogat, G. A., Levendosky, A. A., & Von Eye, A. (2016). The influence of prenatal intimate partner violence exposure on hypothalamic–pituitary–adrenal axis reactivity and childhood internalizing and externalizing symptoms. *Development and psychopathology*, *28*(1), 55-72.

Marquez-Arrico, J. E., Benaiges, I., & Adan, A. (2015). Strategies to cope with treatment in substance use disorder male patients with and without schizophrenia. *Psychiatry research, 228*(3), 752-759.

Matsuura, N., Hashimoto, T., & Toichi, M. (2009). Correlations among self-esteem, aggression, adverse childhood experiences and depression in inmates of a female juvenile correctional facility in Japan. *Psychiatry and Clinical Neurosciences,* 63(4), 478–485. https://dx.doi.org/10.1111/j.1440-1819.2009.01996.x

Mayo Foundation for Medical Education and Research (2016). Diseases and Conditions: Mental Illness. http://www.mayoclinic.org/diseases-conditions/mental-illness/basics/definition/CON-20033813

McGrath, J. J., Petersen, L., Agerbo, E., Mors, O., Mortensen, P. B., & Pedersen, C. B. (2014). A comprehensive assessment of parental age and psychiatric disorders. *JAMA psychiatry*, 71(3), 301-309.

McLafferty, M., Armour, C., McKenna, A., O'Neill, S., Murphy, S., & Bunting, B. (2015). Childhood adversity profiles and adult psychopathology in a representative Northern Ireland study. *Journal of Anxiety Disorders*, 35, 42-48.

McLaughlin, K. A. (2016). Future directions in childhood adversity and youth psychopathology. *Journal of Clinical Child & Adolescent Psychology*, *45*(3), 361-382.

McLaughlin, K. A., Costello, E. J., Leblanc, W., Sampson, N. A., & Kessler, R. C. (2012). Socioeconomic status and adolescent mental disorders. *American journal of public health*, 102(9), 1742-1750.

Mechanic, D., & Tanner, J. (2007). Vulnerable people, groups, and populations: societal view. *Health Affairs*, *26*(5), 1220-1230.

MedicineNet Inc. (2016a). Definition of Family History. http://www.medicinenet.com/script/main/art.asp?articlekey=18321

MedicineNet Inc. (2016b) Definition of Prevalence. http://www.medicinenet.com/script/main/art.asp?articlekey=11697

Meece, Judith L. Child and Adolescent Development for Educators with Free Making the Grade. McGraw-Hill Humanities, Social Sciences & World Languages, 2001. https://chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Ffiles.eric.ed.gov%2Ffulltext%2FED498392.pdf&clen=452596

Meier, S.M., Agerbo, E., Maier, R., Pedersen, C.B., Lang, M., Grove, J., Hollegaard, M.V., Demontis, D., Trabjerg, B.B., Hjorthøj, C. & Ripke, S. (2016). High

loading of polygenic risk in cases with chronic schizophrenia. *Molecular Psychiatry* 21 (7), 969–974. https://doi.org/10.1038/mp.2015.130.

Melton, T. H., Croarkin, P. E., Strawn, J. R., & Mcclintock, S. M. (2016). Comorbid anxiety and depressive symptoms in children and adolescents: a systematic review and analysis. *Journal of psychiatric practice*, *22*(2), 84.

Mendonça, M. F. S. D., & Ludermir, A. B. (2017). Intimate partner violence and incidence of common mental disorder. *Revista de saude publica*, *51*, 32.

Middelburg, R. A., & van der Bom, J. G. (2015). Transfusion-related acute lung injury not a two-hit, but a multicausal model. *Transfusion*, *55*(5), 953-960.

Middleton, J. S., Gattis, M. N., Frey, L. M., & Roe-Sepowitz, D. (2018). Youth experiences survey (YES): Exploring the scope and complexity of sex trafficking in a sample of youth experiencing homelessness. *Journal of Social Service Research*, *44*(2), 141-157.

Miller, H. V., & Barnes, J. C. (2015). The association between parental incarceration and health, education, and economic outcomes in young adulthood. *American Journal of Criminal Justice*, 40(4), 765-784.

Miller, K. E., & Rasmussen, A. (2017). The mental health of civilians displaced by armed conflict: an ecological model of refugee distress. *Epidemiology and psychiatric sciences*, *26*(2), 129-138.

Moeller, T. P., Bachman, G. A. & Moeller. J. R. (1993). The combined effects of physical, sexual, and emotional abuse during childhood (long-term health consequences for women). *Child abuse & neglect,*17:623–640.

Mojtabai, R., Stuart, E. A., Hwang, I., Susukida, R., Eaton, W. W., Sampson, N., & Kessler, R. C. (2015). Long-term effects of mental disorders on employment in the National Comorbidity Survey ten-year follow-up. *Social psychiatry and psychiatric epidemiology*, *50*(11), 1657-1668.

Möller, H. J., Bandelow, B., Bauer, M., Hampel, H., Herpertz, S. C., Soyka, M., Utako B. Barnikol, Simone Lista, Emanuel Severus, & Maier, W. (2015). DSM-5 reviewed from different angles: goal attainment, rationality, use of evidence, consequences—part 2: bipolar disorders, schizophrenia spectrum disorders, anxiety disorders, obsessive–compulsive disorders, trauma-and stressor-related disorders, personality disorders, substance-related and addictive disorders, neurocognitive disorders. *European archives of psychiatry and clinical neuroscience*, 265(2), 87-106.

Mongan, D., Shannon, C., Hanna, D., Boyd, A., & Mulholland, C. (2019). The association between specific types of childhood adversity and attenuated psychotic symptoms in a community sample. *Early intervention in psychiatry*, *13*(2), 281-289.

Moreira, H., & Canavarro, M. C. (2015). Individual and gender differences in mindful parenting: The role of attachment and caregiving representations. *Personality and Individual Differences*, *87*, 13-19.

Muentner, L., Holder, N., Burnson, C., Runion, H., Weymouth, L., & Poehlmann-Tynan, J. (2019). Jailed parents and their young children: Residential instability,

homelessness, and behavior problems. *Journal of child and family studies*, *28*(2), 370-386.

Nagy, N., Sabry, W., Khalifa, D., Hashem, R., Zahran, N., & Khalil, A. H. (2015). Relapse rate and outcome correlates in Egyptian patients with bipolar disorder treated with behavioral family psychoeducation. *Middle East Current Psychiatry*, *22*(3), 121-131.

National Institutes of Health (n.d.). NCI Dictionary of Cancer Terms.https://www.cancer.gov/publications/dictionaries/cancer-terms/def/risk-factor

National Population Commission (2012). Federal Republic of Nigeria 2006 Population and Housing Census, PRIORITY TABLE VOL. IV: Population Distribution by Age & Sex (State & Local Government Area). www.population.gov.ng

National Population Commission [Nigeria] and ICF International (2014). Nigeria Demographic and Health Survey 2013. Rockville, Maryland, USA – National Population Commission and ICF International.

Neale, B. M., & Sklar, P. (2015). Genetic analysis of schizophrenia and bipolar disorder reveals polygenicity but also suggests new directions for molecular interrogation. *Current opinion in neurobiology*, *30*, 131-138.

Nelson, S. M., Cunningham, N. R., & Kashikar-Zuck, S. (2017). A conceptual framework for understanding the role of adverse childhood experiences in pediatric chronic pain. *The Clinical journal of pain*, *33*(3), 264.

Nestler, E. J., Peña, C. J., Kundakovic, M., Mitchell, A., & Akbarian, S. (2016). Epigenetic basis of mental illness. *The Neuroscientist*, *22*(5), 447-463.

Neves-Pereira, M., Mundo, E., Muglia, P., King, N., Macciardi, F., & Kennedy, J. L. (2002). The brain-derived neurotrophic factor gene confers susceptibility to bipolar disorder: evidence from a family-based association study. *The American Journal of Human Genetics*, 71(3), 651-655. http://ac.els-cdn.com/S0002929707603462/1-s2.0-S0002929707603462-main.pdf?_tid=451f565e-c0b2-11e5-9c8a-00000aacb361&acdnat=1453430940_0cc7239259c8217aeedf0baee1356673

Newman, L., Judd, F., Olsson, C. A., Castle, D., Bousman, C., Sheehan, P., Pantelis, C., Craig, J.M., Komiti, A. & Everall, I. (2016). Early origins of mental disorder-risk factors in the perinatal and infant period. *BMC psychiatry*, *16*(1), 270.

Newman, M. G., Shin, K. E., & Zuellig, A. R. (2016). Developmental risk factors in generalized anxiety disorder and panic disorder. *Journal of affective disorders*, *206*, 94-102.

Nigeria Bureau of Statistics (2020). Population and Migration. https://nigerianstat.gov.ng/elibrary

Nongrum, R., Thomas, E., Lionel, J., & Jacob, K. S. (2014). Domestic violence as a risk factor for maternal depression and neonatal outcomes: a hospital-based cohort study. *Indian journal of psychological medicine*, *36*(2), 179.

Nurius, P. S., Green, S., Logan-Greene, P., & Borja, S. (2015). Life course pathways of adverse childhood experiences toward adult psychological well-being: A stress process analysis. *Child abuse & neglect*, *45*, 143-153.

Nusslock, R., & Miller, G. E. (2016). Early-life adversity and physical and emotional health across the lifespan: a neuroimmune network hypothesis. *Biological psychiatry*, *80*(1), 23-32.

Nwabueze, C., & Nwankwo, N. N. (2016). Ethnicity and doctor-patient communication: an exploratory study of University of Abuja Teaching Hospital, Nigeria. *Journal of Participatory Medicine*, 8, e12.

Obradović, J., Yousafzai, A. K., Finch, J. E., & Rasheed, M. A. (2016). Maternal scaffolding and home stimulation: Key mediators of early intervention effects on children's cognitive development. *Developmental psychology*, *52*(9), 1409.

Ofonedu, M. E., Maepa, M. P., & Idemudia, E. S. (2015). The relationship between Parenting styles and childhood trauma: a study of street children in Limpopo Province, South Africa. *African Journal for Physical Health Education, Recreation and Dance*, *21*(2), 552-565.

Ogundele, O. J. K., Akingbade, W. A., & Akinlabi, H. B. (2012). Entrepreneurship training and education as strategic tools for poverty alleviation in Nigeria. *American International Journal of Contemporary Research*, *2*(1), 148-156.

O'Mahony, S. M., Clarke, G., Dinan, T. G., & Cryan, J. F. (2017). Early-life adversity and brain development: Is the microbiome a missing piece of the puzzle? *Neuroscience*, *342*, 37-54.

O'Mahen, H. A., Karl, A., Moberly, N., & Fedock, G. (2015). The association between childhood maltreatment and emotion regulation: two different mechanisms contributing to depression? *Journal of affective disorders*, *174*, 287-295.

Okechukwu, A. A. (2011). Discharge against medical advice in children at the University of Abuja Teaching Hospital, Gwagwalada, Nigeria. *Journal of Medical Sciences*, 2, 949-54.

Ornell, F., Schuch, J. B., Sordi, A. O., & Kessler, F. H. P. (2020). "Pandemic fear" and COVID-19: mental health burden and strategies. *Brazilian Journal of Psychiatry*, *42*(3), 232-235.v Ornell, F., Schuch, J. B., Sordi, A. O., & Kessler, F. H. P. (2020). "Pandemic fear" and COVID-19: mental health burden and strategies. *Brazilian Journal of Psychiatry*, 42(3), 232-235.

Otto, Y., Kolmorgen, K., Sierau, S., Weis, S., von Klitzing, K., & Klein, A. M. (2016). Parenting behaviors of mothers and fathers of preschool age children with internalizing disorders. *Journal of Child and Family Studies, 25*(2), 381-395.

Palmier-Claus, J. E., Berry, K., Bucci, S., Mansell, W., & Varese, F. (2016). Relationship between childhood adversity and bipolar affective disorder: systematic review and meta-analysis. *The British Journal of Psychiatry, 209*(6), 454-459.

Paniagua, F. A., & Yamada, A. M. (Eds.). (2013). Handbook of multicultural mental health: Assessment and treatment of diverse populations. Academic Press.

Paquette, A. (2015). *Placental DNA methylation, prenatal programming, and newborn neurobehavior*. Dartmouth College.

Park, M., Chang, E. R., & You, S. (2015). Protective role of coping flexibility in PTSD and depressive symptoms following trauma. *Personality and Individual Differences*, *82*, 102-106.

Park, S. H., Videlock, E. J., Shih, W., Presson, A. P., Mayer, E. A., & Chang, L. (2016). Adverse childhood experiences are associated with irritable bowel syndrome and gastrointestinal symptom severity. *Neurogastroenterology & Motility*, *28*(8), 1252-1260.

Patten, S. B. (2013). Childhood and adult stressors and major depression risk: interpreting interactions with the sufficient-component cause model. *Social psychiatry and psychiatric epidemiology*, *48*(6), 927-933.

Paul, K. I. & Moser, K. (2009). Unemployment impairs mental health: meta-analyses. *Journal of Vocational Behavior*,74, 264–282

Paul, E., & Eckenrode, J. (2015). Childhood psychological maltreatment subtypes and adolescent depressive symptoms. Child abuse & neglect, 47, 38-47.

Perreault, M., Touré, E. H., Perreault, N., & Caron, J. (2017). Employment status and mental health: Mediating roles of social support and coping strategies. *Psychiatric Quarterly*, *88*(3), 501-514.

Picardi, A., Lega, I., & Tarolla, E. (2013). Suicide risk in skin disorders. *Clinics in dermatology*, 31(1), 47-56.

Pickett, K. E., & Wilkinson, R. G. (2015). Income inequality and health: a causal review. Social science & medicine, 128, 316-326.

Pine, D. S., & Fox, N. A. (2015). Childhood antecedents and risk for adult mental disorders. *Annual Review of Psychology*, *66*, 459-485.

Pitkänen, J., Remes, H., Aaltonen, M., & Martikainen, P. (2019). Experience of maternal and paternal adversities in childhood as determinants of self-harm in adolescence and young adulthood. *Journal of Epidemiology and Community Health*, 73(11), 1040-1046.

Plant, D. T., Pariante, C. M., Sharp, D., & Pawlby, S. (2015). Maternal depression during pregnancy and offspring depression in adulthood: role of child maltreatment. *The British Journal of Psychiatry*, *207*(3), 213-220.

Pool, M. S., Otupiri, E., Owusu-Dabo, E., De Jonge, A., & Agyemang, C. (2014). Physical violence during pregnancy and pregnancy outcomes in Ghana. *BMC pregnancy and childbirth*, *14*(1), 71.

Poole, J. C., Dobson, K. S., & Pusch, D. (2017). Anxiety among adults with a history of childhood adversity: Psychological resilience moderates the indirect effect of emotion dysregulation. *Journal of affective disorders*, *217*, 144-152.

Porche, M., Fortuna, L., Wachholtz, A., & Stone, R. (2015). Distal and proximal religiosity as protective factors for adolescent and emerging adult alcohol use. *Religions*, 6(2), 365-384.

Power, M., & Dalgleish, T. (2015). *Cognition and emotion: From order to disorder*. Psychology press.

Preisig, M., Strippoli, M. P. F., Castelao, E., Merikangas, K. R., Gholam-Rezaee, M., Marquet, P., Aubry, J.M. & Vandeleur, C. L. (2016). The specificity of the familial aggregation of early-onset bipolar disorder: a controlled 10-year follow-up study of offspring of parents with mood disorders. *Journal of affective disorders*, *190*, 26-33.

ProThesis Writer (2021) [Blog]. The role of limitations in research: why they are important. How to Organize Limitations of a Research Study. https://prothesiswriter.com/blog/limitations-in-research

Public Health Action Support Team (2020). Errors in epidemiological measurements. https://www.healthknowledge.org.uk/e-learning/epidemiology/practitioners/errors-epidemiological-measurements

Quon, E. C., & McGrath, J. J. (2014). Subjective socioeconomic status and adolescent health: a meta-analysis. *Health Psychology*, *33*(5), 433.

Ramiro, L. S., Madrid, B. J., & Brown, D. W. (2010). Adverse childhood experiences (ACE) and health-risk behaviors among adults in a developing country setting. *Child Abuse & Neglect*, 34(11), 842–855. https://dx.doi.org/10.1016/j.chiabu.2010.02.012

Ran, M., Xiao, Y., Zhao, X., Zhang, T., Yu, Y., Mao, W., Lin, F., Liu, B. & Chan, C. L. (2017). Family history of psychosis and outcome of people with schizophrenia in rural China: 14-year follow-up study, *Asian Journal of Psychiatry*, 32, 14-19. https://doi.org/10.1016/j.ajp.2017.11.016

Ranning, A., Laursen, T. M., Thorup, A., Hjorthøj, C., & Nordentoft, M. (2015). Serious mental illness and disrupted caregiving for children: a nationwide, register-based cohort study. *The Journal of clinical psychiatry*, *76*(8), 1006-1014.

Rapoport, J., Chavez, A., Greenstein, D., Addington, A., & Gogtay, N. (2009). Autism spectrum disorders and childhood-onset schizophrenia: clinical and biological contributions to a relation revisited. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(1), 10-18.

Read, J., Bentall, R. P. & Fosse, R. (2009). Time to abandon the bio-bio-bio model of psychosis: exploring the epigenetic and psychological mechanisms by which adverse life events lead to psychotic symptoms. *Epidemiol Psichiatr Soc*; 18: 299–310.

Reading, C., & Greenwood, M. (2018). Structural determinants of Aboriginal peoples' health. *Determinants of Indigenous Peoples' Health: Beyond the Social*, *1*.

Reavis, J. A., Looman, J., Franco, K. A., & Rojas, B. (2013). Adverse childhood experiences and adult criminality: How long must we live before we possess our own lives?. The Permanente Journal, 17(2), 44.

Reiff, M., Castille, D. M., Muenzenmaier, K., & Link, B. (2012). Childhood abuse and the content of adult psychotic symptoms. Psychological Trauma: Theory, Research, *Practice, and Policy*, 4(4), 356.

Reininghaus, U., Gayer-Anderson, C., Valmaggia, L., Kempton, M. J., Calem, M., Onyejiaka, A., ... & Mills, J. G. (2016). Psychological processes underlying the

association between childhood trauma and psychosis in daily life: an experience sampling study. *Psychological medicine*, *46*(13), 2799-2813.

Roehrig, C. (2016). Mental disorders top the list of the most costly conditions in the United States: $201 billion. Health Affairs, 35(6), 1130-1135.

Rohde, N., Tang, K. K., Osberg, L., & Rao, P. (2016). The effect of economic insecurity on mental health: Recent evidence from Australian panel data. *Social Science & Medicine*, *151*, 250-258.

Romens, S. E., McDonald, J., Svaren, J., & Pollak, S. D. (2015). Associations between early life stress and gene methylation in children. *Child development*, *86*(1), 303-309.

Rosenberg, M., & Waugh, M. S. (1999). Causes and consequences of oral contraceptive noncompliance. *American journal of obstetrics and gynecology*, *180*(2), S276-S279.

Rothman, K. J., & Greenland, S. (2005). Causation and causal inference in epidemiology. *American journal of public health*, 95(S1), S144-S150.

Romens, S. E., McDonald, J., Svaren, J., & Pollak, S. D. (2015). Associations between early life stress and gene methylation in children. *Child development*, *86*(1), 303-309.

Sachs-Ericsson, N. J., Sheffler, J. L., Stanley, I. H., Piazza, J. R., & Preacher, K. J. (2017). When emotional pain becomes physical: adverse childhood experiences, pain, and the role of mood and anxiety disorders. *Journal of clinical psychology*, *73*(10), 1403-1428.

Salem, G. M., Allah, M. B. A., & Said, R. M. (2016). Prevalence and predictors of depression, anxiety and stress among Zagazig University students. *Med J Cairo Univ*, *84*(2), 325-334.

Schaller, J., & Stevens, A. H. (2015). Short-run effects of job loss on health conditions, health insurance, and health care utilization. *Journal of health economics*, *43*, 190-203.

Schäfer, J. Ö., Naumann, E., Holmes, E. A., Tuschen-Caffier, B., & Samson, A. C. (2017). Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *Journal of youth and adolescence*, *46*(2), 261-276.

Schimmenti, A., & Bifulco, A. (2015). Linking lack of care in childhood to anxiety disorders in emerging adulthood: the role of attachment styles. *Child and Adolescent Mental Health*, 20(1), 41-48.

Seijo, D., Fariña, F., Corras, T., Novo, M., & Arce, R. (2016). Estimating the epidemiology and quantifying the damages of parental separation in children and adolescents. *Frontiers in psychology*, *7*, 1611.

Seleem, M. A., & Saada, S. A. (2015). Metacognitive Functions in a Sample of Egyptian Patients with Obsessive-Compulsive Disorder= الوظائف ما وراء المعرفية في عينة من المصريين المصابين باضطراب الوسواس القهري. *The Arab Journal of Psychiatry*, *44*(2151), 1-13.

Sharma, S., Powers, A., Bradley, B., & Ressler, K. J. (2016). Gene× environment determinants of stress-and anxiety-related disorders. *Annual review of psychology*, *67*, 239-261.

Shaw, T. V., Bright, C. L., & Sharpe, T. L. (2015). Child welfare outcomes for youth in care as a result of parental death or parental incarceration. *Child abuse & neglect*, *42*, 112-120.

Shin, H., Han, C., & Kohzuki, M. (2010). Social mobility and psychiatric disabilities: an assessment of the social causation and social selection hypotheses. *The Tohoku Journal of Experimental Medicine*, *222*(1), 23-31

Shokouh, S. M. H., Mohammad, A. R. A. B., Emamgholipour, S., Rashidian, A., Montazeri, A., & Zaboli, R. (2017). Conceptual models of social determinants of health: A narrative review. *Iranian journal of public health*, *46*(4), 435.

Shonkoff, J. P., Garner, A. S., Siegel, B. S., Dobbins, M. I., Earls, M. F., McGuinn, L., ... & Committee on Early Childhood, Adoption, and Dependent Care. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, 129(1), e232-e246.

Siegenthaler, E., Munder, T., & Egger, M. (2012). Effect of preventive interventions in mentally ill parents on the mental health of the offspring: systematic review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51(1), 8-17.

Sirois, F. M., & Kitner, R. (2015). Less adaptive or more maladaptive? A meta-analytic investigation of procrastination and coping. *European Journal of Personality*, *29*(4), 433-444.

Sloan, E., Hall, K., Moulding, R., Bryce, S., Mildred, H., & Staiger, P. K. (2017). Emotion regulation as a transdiagnostic treatment construct across anxiety,

depression, substance, eating and borderline personality disorders: A systematic review. *Clinical psychology review*, 57, 141-163.

Smith, S. M., Goldstein, R. B., & Grant, B. F. (2016). The association between post-traumatic stress disorder and lifetime DSM-5 psychiatric disorders among veterans: Data from the National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III). *Journal of psychiatric research, 82*, 16-22.

Someshwar, A., Holla, B., Agarwal, P. P., Thomas, A., Jose, A., Joseph, B., Raju, B., Karle, H., Muthukumaran, M., Kodancha, P.G. & Kumar, P. (2019). Adverse childhood experiences in families with multiple members diagnosed to have psychiatric illnesses. *Australian & New Zealand Journal of Psychiatry*, 54(11), 1086-1094..

Sonuga-Barke, E. J. (2005). Causal models of attention-deficit/hyperactivity disorder: from common simple deficits to multiple developmental pathways. *Biological psychiatry*, *57*(11), 1231-1238.

Sorocco, K. H., Carnes, N. C., Cohoon, A. J., Vincent, A. S., & Lovallo, W. R. (2015). Risk factors for alcoholism in the Oklahoma Family Health Patterns project: impact of early life adversity and family history on affect regulation and personality. *Drug and alcohol dependence*, *150*, 38-45.

Sparrow, K., Kwan, J., Howard, L., Fear, N., & MacManus, D. (2017). Systematic review of mental health disorders and intimate partner violence victimization among military populations. Social psychiatry and psychiatric epidemiology, 52(9), 1059-1080.

Sterne, J. A., Hernán, M. A., Reeves, B. C., Savović, J., Berkman, N. D., Viswanathan, M., Henry, D., Altman, D.G., Ansari, M.T., Boutron, I. & Carpenter, J. R. (2016). ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *British Medical Journal, 355*, i4919.

Stikkelbroek, Y., Bodden, D. H., Reitz, E., Vollebergh, W. A., & van Baar, A. L. (2016). Mental health of adolescents before and after the death of a parent or sibling. *European child & adolescent psychiatry, 25*(1), 49-59.

Strunz, S., Westphal, L., Ritter, K., Heuser, I., Dziobek, I., & Roepke, S. (2015). Personality pathology of adults with autism spectrum disorder without accompanying intellectual impairment in comparison to adults with personality disorders. *Journal of autism and developmental disorders*, 45(12), 4026-4038.

Sugaya, L., Hasin, D. S., Olfson, M., Lin, K. H., Grant, B. F., & Blanco, C. (2012). Child physical abuse and adult mental health: a national study. *Journal of traumatic stress*, 25(4), 384-392.

Sugg, N. (2015). Intimate partner violence: prevalence, health consequences, and intervention. *Medical Clinics*, *99*(3), 629-649.

Susser, M. (1998). Does risk factor epidemiology put epidemiology at risk? *Journal Epidemiology and Community Health*, 52, 608-611.

Suzuki, H., & Tomoda, A. (2015). Roles of attachment and self-esteem: impact of early life stress on depressive symptoms among Japanese institutionalized children. *BMC psychiatry*, 15(1), 8.

Taillieu, T. L., Brownridge, D. A., Sareen, J., & Afifi, T. O. (2016). Childhood emotional maltreatment and mental disorders: Results from a nationally representative adult sample from the United States. *Child Abuse & Neglect*, 59, 1-12.

Tajan, N. (2015). Social withdrawal and psychiatry: A comprehensive review of Hikikomori. *Neuropsychiatrie de l'Enfance et de l'Adolescence*, *63*(5), 324-331.

Teferra, S., & Shibre, T. (2012). Perceived causes of severe mental disturbance and preferred interventions by the Borana semi-nomadic population in southern Ethiopia: a qualitative study. *BMC psychiatry*, 12(1), 79.

Teschke, K., Olshan, A. F., Daniels, J. L., De Roos, A. J., Parks, C. G., Schulz, M., & Vaughan, T. L. (2002). Occupational exposure assessment in case–control studies: opportunities for improvement. *Occupational and Environmental Medicine*, *59*(9), 575-594.

Tost, H., Champagne, F. A., & Meyer-Lindenberg, A. (2015). Environmental influence in the brain, human welfare and mental health. *Nature Neuroscience*, *18*(10), 1421.

Trautmann, S., Rehm, J., & Wittchen, H. U. (2016). The economic costs of mental disorders: Do our societies react appropriately to the burden of mental disorders? *EMBO reports*, 17(9), 1245-1249.

Tremblay, S. (2017). *A cognitive approach to situation awareness: theory and application*. Routledge.

Turney, K. (2017). Unmet health care needs among children exposed to parental incarceration. *Maternal and child health journal*, *21*(5), 1194-1202.

Tyrer, P., Reed, G. M., & Crawford, M. J. (2015). Classification, assessment, prevalence, and effect of personality disorder. *The Lancet*, *385*(9969), 717-726.

University of Colorado Denver (2016). Moving Upstream: The Story of Prevention. http://www.ucdenver.edu/academics/colleges/PublicHealth/research/Pages/index.aspx

Universiteit Leiden (2015). Cognitive Emotion Regulation Questionnaire (CERQ). In Research Clinical Psychology. http://www.socialsciences.leiden.edu/psychology/organisation/clinical/research/instruments/cognitive-emotion-regulation-questionnaire-cerq.html

Universiteit Leiden (n.d.). Cognitive Emotion Regulation Questionnaire (CERQ). In Research project. https://www.universiteitleiden.nl/en/research/research-projects/social-and-behavioural-sciences/cognitive-emotion-regulation-questionnaire-cerq

Urfer-Parnas, A., Lykke Mortensen, E., Saebye, D., & Parnas, J. (2010). Pre-morbid IQ. in mental disorders: a Danish draft-board study of 7486 psychiatric patients. *Psychological Medicine;* 40: 547–556.

U.S. Department of Health & Human Services (2021). Mental Health. Center for Disease Control and Prevention. https://www.cdc.gov/mentalhealth/learn/index.htm

Van Dam, D. S., van Nierop, M., Viechtbauer, W., Velthorst, E., van Winkel, R., Bruggeman, R., Cahn, W., de Haan, L., Kahn, R.S. & Myin-Germeys, I. (2015). Childhood abuse and neglect in relation to the presence and persistence of

psychotic and depressive symptomatology. *Psychological medicine*, *45*(7), 1363-1377.

VanderWeele, T. J. (2017). Invited commentary: the continuing need for the sufficient cause model today. *American journal of epidemiology*, *185*(11), 1041-1043.

Vanguard media limited (April 2017). Minister directs Karu General Hospital to open for immediate use. https://www.vanguardngr.com/2017/04/minister-directs-karu-general-hospital-open-immediate-use/

Van Loon, L. M. A., Van De Ven, M. O. M., Van Doesum, K. T. M., Hosman, C. M. H., & Witteman, C. L. M. (2015, December). Factors promoting mental health of adolescents who have a parent with mental illness: A longitudinal study. In *Child & youth care forum* (Vol. 44, No. 6, pp. 777-799). Springer US.

van Santvoort, F., Hosman, C. M., Janssens, J. M., van Doesum, K. T., Reupert, A., & van Loon, L. M. (2015). The impact of various parental mental disorders on children's diagnoses: a systematic review. *Clinical child and family psychology review*, *18*(4), 281-299.

Vins, H., Bell, J., Saha, S., & Hess, J. (2015). The mental health outcomes of drought: a systematic review and causal process diagram. International journal of environmental research and public health, 12(10), 13251-13275.

Völzke, H. (2012). Multicausality in fatty liver disease: is there a rationale to distinguish between alcoholic and non-alcoholic origin? *World journal of gastroenterology: WJG*, *18*(27), 3492.

Wagner, S., Müller, C., Helmreich, I., Huss, M., & Tadić, A. (2015). A meta-analysis of cognitive functions in children and adolescents with major depressive disorder. *European child & adolescent psychiatry*, *24*(1), 5-19.

Wakefield, S., & Wildeman, C. (2011). Mass imprisonment and racial disparities in childhood behavioral problems. *Criminology and Public Policy*, 10, 793–817.

Walden University (2012). Walden University (2012). Course Introduction. https://class.waldenu.edu/webapps/portal/frameset.jsp?tab_tab_group_id=_2_1&url=%2Fwebapps%2Fblackboard%2Fexecute%2Flauncher%3Ftype%3DCourse%26id%3D_1381693_1%26url%3D

Walker, E. R., McGee, R. E., & Druss, B. G. (2015). Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. *JAMA psychiatry*, *72*(4), 334–341. https://doi.org/10.1001/jamapsychiatry.2014.2502

Warnock, F. F., Craig, K. D., Bakeman, R., Castral, T., & Mirlashari, J. (2016). The relationship of prenatal maternal depression or anxiety to maternal caregiving behavior and infant behavior self-regulation during infant heel lance: an ethological time-based study of behavior. *BMC pregnancy and childbirth*, *16*(1), 264.

Weaver, J. M., & Schofield, T. J. (2015). Mediation and moderation of divorce effects on children's behavior problems. *Journal of Family Psychology*, 29(1), 39.

Wells, N. M., Evans, G. W., & Cheek, K. A. (2016). Environmental psychology. *Environmental health: From global to local*, *203*.

Westbrook, A., & Braver, T. S. (2015). Cognitive effort: A neuroeconomic approach. *Cognitive, Affective, & Behavioral Neuroscience*, *15*(2), 395-415.

Wilcox, C. E., Pommy, J. M., & Adinoff, B. (2016). Neural circuitry of impaired emotion regulation in substance use disorders. *American Journal of Psychiatry*, *173*(4), 344-361.

Wildeman, C. (2010). Paternal incarceration and children's physically aggressive behaviors: Evidence from the Fragile Families and Child Wellbeing Study. *Social Forces*, 89, 285–309.

Wilkinson, R and Pickett, K (2010) Different Strokes for Different Folks. In the Spirit Level: Educational Performance. USA, New York. Bloombury Press.

Williams, D. R., Priest, N., & Anderson, N. B. (2016). Understanding associations among race, socioeconomic status, and health: Patterns and prospects. *Health Psychology*, *35*(4), 407.

Williamson, K. (2020). Research techniques: Questionnaires and interviews in Research Methods for Students, Academics and Professionals (2nd Edition). Retrieved from: https://www.sciencedirect.com/topics/computer-science/administered-questionnaire

Williamson, V., Stevelink, S. A. M., Greenberg, K., & Greenberg, N. (2017). The prevalence of mental health disorders in elderly US military veterans: a meta-analysis and systematic review. American Journal of Geriatric Psychiatry. https://doi.org/10.1016/j.jagp.2017.11.001

Wolff, K. T., Cuevas, C., Intravia, J., Baglivio, M. T., & Epps, N. (2018). The effects of neighborhood context on exposure to adverse childhood experiences (ACE) among adolescents involved in the juvenile justice system: Latent classes and contextual effects. Journal of youth and adolescence, 47(11), 2279-2300.

World Health Organization (2020). World health report. Mental disorders affect one in four people. Retrieved from: https://www.who.int/whr/2001/media_centre/press_release/en/

World Health Organization (2020). "Chapter 2: Key goals of global risk assessment." The world health report. http://www.who.int/whr/2002/chapter2/en/index4.html

World Population Review (2019). Abuja Population 2020. http://worldpopulationreview.com/world-cities/abuja-population/

Wu, Y. T., Prina, A. M., Jones, A., Matthews, F. E., Brayne, C., & CFAS, M. (2015). Older people, the natural environment and common mental disorders: cross-sectional results from the Cognitive Function and Ageing Study. *BMJ open*, *5*(9), e007936.

Wyssen, A., Bryjova, J., Meyer, A. H., & Munsch, S. (2016). A model of disturbed eating behavior in men: the role of body dissatisfaction, emotion dysresgulation and cognitive distortions. *Psychiatry research*, *246*, 9-15.

Yada, Y. (2017). Method to estimate relative risk using exposed proportion and case group data. *Scientific reports*, *7*(1), 1-9.

Yang, B. Z., Zhang, H., Ge, W., Weder, N., Douglas-Palumberi, H., Perepletchikova, F., ... & Kaufman, J. (2013). Child abuse and epigenetic mechanisms of disease risk. *American journal of preventive medicine*, 44(2), 101-107.

Yap, M. B. H., & Jorm, A. F. (2015). Parental factors associated with childhood anxiety, depression, and internalizing problems: A systematic review and meta-analysis. *Journal of affective disorders*, *175*, 424-440.

Yeshurun, S., & Hannan, A. J. (2019). Transgenerational epigenetic influences of paternal environmental exposures on brain function and predisposition to psychiatric disorders. *Molecular psychiatry*, *24*(4), 536-548.

Yeung, N. C., Lu, Q., Wong, C. C., & Huynh, H. C. (2016). The roles of needs satisfaction, cognitive appraisals, and coping strategies in promoting posttraumatic growth: A stress and coping perspective. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(3), 284.

Zammit, S., Lewis, G., Dalman, C., & Allebeck, P. (2010). Examining interactions between risk factors for psychosis. The British Journal of Psychiatry, 197(3), 207-211.

Zarse, E. M., Neff, M. R., Yoder, R., Hulvershorn, L., Chambers, J. E., & Chambers, R. A. (2019). The adverse childhood experiences questionnaire: two decades of research on childhood trauma as a primary cause of adult mental illness, addiction, and medical diseases. *Cogent Medicine*, *6*(1), 1581447.

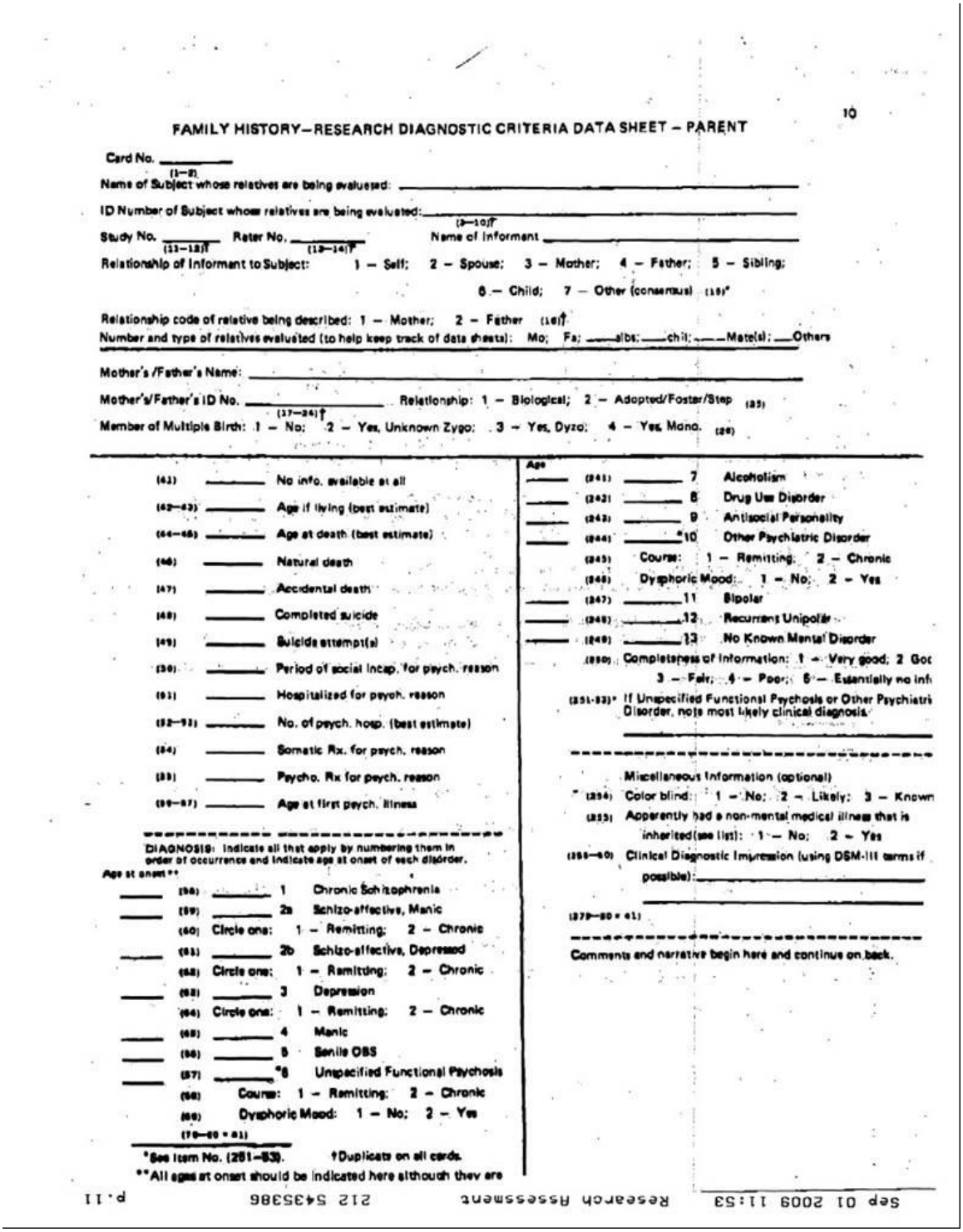
Zhang, H., & Hoffmann, H. (2016). Maximizing performance under a power cap: A comparison of hardware, software, and hybrid techniques. *ACM SIGPLAN Notices*, *51*(4), 545-559.

Zhang, X., Norton, J., Carriere, I., Ritchie, K., Chaudieu, I., & Ancelin, M. L. (2015). Risk factors for late-onset generalized anxiety disorder: results from a 12-year prospective cohort (The ESPRIT study). *Translational psychiatry*, *5*(3), e536-e536.

Zimmerman, M., Coryell, W., Pfohl, B., & Stangl, D. (1988). The reliability of the family history method for psychiatric diagnoses. *Archives of General Psychiatry*, *45*(4), 320-322.

Zoccali, C. (2017). Causal mechanism and component causes in Mesoamerican–Sri Lankan nephropathy: the moderator's view. *Nephrology Dialysis Transplantation*, *32*(4), 607-610.

Appendix



FAMILY HISTORY—RESEARCH DIAGNOSTIC CRITERIA DATA SHEET – PARENT

10

Card No. _____ (1–2)

Name of Subject whose relatives are being evaluated: _____

ID Number of Subject whose relatives are being evaluated: _____ (3–10)†

Study No. _____ (11–12)† Rater No. _____ (13–14)† Name of Informant _____

Relationship of Informant to Subject: 1 – Self; 2 – Spouse; 3 – Mother; 4 – Father; 5 – Sibling; 6 – Child; 7 – Other (consensus) (15)*

Relationship code of relative being described: 1 – Mother; 2 – Father (16)†

Number and type of relatives evaluated (to help keep track of data sheets): Mo; Fa; ___sibs; ___chil; ___Mate(s); ___Others

Mother's /Father's Name: _____

Mother's/Father's ID No. _____ (17–24)† Relationship: 1 – Biological; 2 – Adopted/Foster/Step (25)

Member of Multiple Birth: 1 – No; 2 – Yes, Unknown Zygo; 3 – Yes, Dyzo; 4 – Yes, Mono. (26)

(41) _____ No info. available at all

(42–43) _____ Age if living (best estimate)

(44–45) _____ Age at death (best estimate)

(46) _____ Natural death

(47) _____ Accidental death

(48) _____ Completed suicide

(49) _____ Suicide attempt(s)

(50) _____ Period of social incap. for psych. reason

(51) _____ Hospitalized for psych. reason

(52–53) _____ No. of psych. hosp. (best estimate)

(54) _____ Somatic Rx. for psych. reason

(55) _____ Psycho. Rx for psych. reason

(56–57) _____ Age at first psych. illness

DIAGNOSIS: Indicate all that apply by numbering them in order of occurrence and indicate age at onset of each disorder.

Age at onset**

(58) _____ 1 Chronic Schizophrenia

(59) _____ 2a Schizo-affective, Manic

(60) Circle one: 1 – Remitting; 2 – Chronic

(61) _____ 2b Schizo-affective, Depressed

(62) Circle one: 1 – Remitting; 2 – Chronic

(63) _____ 3 Depression

(64) Circle one: 1 – Remitting; 2 – Chronic

(65) _____ 4 Manic

(66) _____ 5 Senile OBS

(67) _____ *6 Unspecified Functional Psychosis

(68) Course: 1 – Remitting; 2 – Chronic

(69) Dysphoric Mood: 1 – No; 2 – Yes

(70–89 = 91)

*See Item No. (251–53). †Duplicate on all cards.

**All ages at onset should be indicated here although they are

Age

_____ (241) _____ 7 Alcoholism

_____ (242) _____ 8 Drug Use Disorder

_____ (243) _____ 9 Antisocial Personality

_____ (244) _____ *10 Other Psychiatric Disorder

(245) Course: 1 – Remitting; 2 – Chronic

(246) Dysphoric Mood: 1 – No; 2 – Yes

_____ (247) _____ 11 Bipolar

_____ (248) _____ 12 Recurrent Unipolar

_____ (249) _____ 13 No Known Mental Disorder

(250) Completeness of Information: 1 – Very good; 2 Goo 3 – Fair; 4 – Poor; 5 – Essentially no inf

(251–53)* If Unspecified Functional Psychosis or Other Psychiatri Disorder, note most likely clinical diagnosis.

Miscellaneous Information (optional)

(254) Color blind: 1 – No; 2 – Likely; 3 – Known

(255) Apparently had a non-mental medical illness that is inherited(see list): 1 – No; 2 – Yes

(256–60) Clinical Diagnostic Impression (using DSM-III terms if possible): _____

(279–80 = 81)

Comments and narrative begin here and continue on back.

Adverse Childhood Experience (ACE) Questionnaire

Finding your ACE Score ra hbr 10 24 06

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household **often** …
   Swear at you, insult you, put you down, or humiliate you?
   or
   Act in a way that made you afraid that you might be physically hurt?
   Yes No If yes enter 1 _____

2. Did a parent or other adult in the household **often …**
   Push, grab, slap, or throw something at you?
   or
   Ever hit you so hard that you had marks or were injured?
   Yes No If yes enter 1 _____

3. Did an adult or person at least 5 years older than you **ever…**
   Touch or fondle you or have you touch their body in a sexual way?
   or
   Try to or actually have oral, anal, or vaginal sex with you?
   Yes No If yes enter 1 _____

4. Did you **often** feel that …
   No one in your family loved you or thought you were important or special?
   or
   Your family didn't look out for each other, feel close to each other, or support each other?
   Yes No If yes enter 1 _____

5. Did you **often** feel that …
   You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?
   or
   Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
   Yes No If yes enter 1 _____

6. Were your parents ever separated or divorced?
   Yes No If yes enter 1 _____

7. Was your mother or stepmother:
   Often pushed, grabbed, slapped, or had something thrown at her?
   or
   Sometimes or often kicked, bitten, hit with a fist, or hit with something hard?
   or
   Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
   Yes No If yes enter 1 _____

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
   Yes No If yes enter 1 _____

9. Was a household member depressed or mentally ill or did a household member attempt suicide?
   Yes No If yes enter 1 _____

10. Did a household member go to prison?
    Yes No If yes enter 1 _____

Now add up your "Yes" answers: _____ This is your ACE Score

of the above sources = 2; Traditional healer/self-care = 1

ox 1 Scoring of scale for measuring family socioeconomic status (SES) for health research in Egypt

Name of head of family: Address:

Definition of the family: It includes nuclear or joint family. Married couple with unmarried children or without children. Head of the family will be either husband/wife. Dependent father/mother/brother/sister does not become member of the family unless he/she is earning and one kitchen with pooled income is managed by him/her.

This scale includes 7 domains with a total score of 84

Socioeconomic level: to be classified into very low, low, middle and high levels depending on the quartiles of the score calculated.

NB In case of death or retirement of husband or wife, record the education and occupation before death or retirement

Education and cultural domain
(for both husband & wife)
(score = 30)

Highest level of education	Husband	Wife
Illiterate	0	0
Read & write	2	2
Primary	4	4
Preparatory	6	6
Secondary (general & technical of 3 or 5 years)	8	8
Intermediate (2 years) institutes	10	10
University graduate	12	12
Postgraduate degree	14	14

Access to health information (1 each for the following items): Printed materials, e.g. books, posters, booklets, etc.; Audiovisual message on television &/or radio

Occupation domain
(for both husband & wife)
(score = 10)

Occupation	Husband	Wife
Non-working/house wife	0	0
Unskilled manual worker	1	1
Skilled manual worker/farmer	2	2
Trades/business	3	3
Semi-professional/clerk	4	4
Professional	5	5

Family possessions domain
(score = 12: 1 each for the presence of items given below)

Refrigerator – Radio – Television – Washing machine – Telephone/ mobile phone – Car – Agricultural land – Non-agricultural land for housing – Shop or animal shed – Other house (beside the house in which the family is living) – Animals/poultry – Computer/ Internet

Family domain
(score = 10)

Residence: Urban slum = 0; Rural = 1; Urban = 2

Number of family members (parents, children & all dependents): < 5 members = 2; ≥ 5 members = 1

Number of earning family members: 1 member = 1; 2 members = 2; ≥ 3 members = 3

Education of children (aged ≥ 5 years, whether free or private education): All children going or ever gone to school/university = 3; ≥ 50% going or ever gone to school/university = 2; < 50% going or ever gone to school/university = 1; None go/gone to school/university/not applicable = 0

Home sanitation domain
(score = 12)

Services (1 each for the presence of the following items): Pure water supply – Electricity – Natural gas – Sewerage system – Municipal collection of solid wastes – Flush latrine – Air conditioning

Type of house: Owned, ≥ 4 rooms = 4; Owned, < 4 rooms = 3; Rented, ≥ 4 rooms = 2; Rented, < 4 rooms = 1; No place to reside =0

Crowing index: (number of family members divided by number of rooms): ≤ 1 person per room = 1 = 1; > 1 person per room = 0

Economic domain
(score = 5)

Income from all sources: In debt = 0; 1 Just meet routine expenses = 1; Meet routine expenses and emergencies = 2; Able to save/invest money = 3

Family receives governmental support: Yes = 1; No = 0

Family pays tax: Yes = 1; No = 0

Health care domain
(score = 5)

Usual source of health care: Private health facilities = 5; Health insurance = 4; Free governmental health service = 3; More than one